UNIVERSITY OF CALIFORNIA

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Vessels, Burials and Households:

Piñami's Evidence of the Tiwanaku State in the Central Valley of Cochabamba

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in Anthropology

by

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December 2019

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- Additional coursework in ceramic art and art history, California State University Hayward, 1987 to 1991

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- Albert Spaulding Award, Anthropology Department, UC Santa Barbara, 1998, 2003
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- National Science Foundation Dissertation Improvement Grant, 2000
- Humanities and Social Science Research Grant, UC Santa Barbara
- Regents Special 4-Year Fellowship, UC Santa Barbara
- Fulbright pre-dissertation research grant for Bolivia, 1992-1993
- Graduated with Distinction, UC Berkeley, 1987

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Teaching/Lecture/Research Positions

Lecturer, series in Anthropology at Foothill High School, San Jose, California, 2010

Instructor of training courses for local guides at the Piñami Archaeological Museum, Cochabamba, Bolivia. Courses were implemented and designed in collaboration with the Cochabamba Archaeology Museum (courses: "Introduction to Archaeology" and "Prehistory of Bolivia", conducted in Spanish), 2005-2006

Instructor for intensive three-week seminar at the Institute of International Relations, Cochabamba, Bolivia (course: "Introduction to Cultural Anthropology", conducted in Spanish), 2003

Guest Lecturer, UC Santa Barbara (course: "The Ancient Maya"), 2002

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Research Assistant for Katharina Schreiber; instructed and supervised 10 undergraduate interns for a project constructing a Geographic Information System map of the South Coast of Peru for regional settlement pattern analysis, 1997 – 1999

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Museum Positions

Research consultant and archivist for California Nursery Company Historical Park, conducting oral history interviews and website summaries, 2013-2016

Advisor to Project Piñami, site museum development project ("Museo Comunitario Arqueológico Piñami"), Cochabamba, Bolivia, 2007-2015

Director, "Project Piñami", site museum development project ("Museo Comunitario Arqueológico Piñami") , Cochabamba, Bolivia, 2003-2007

Research Assistant for Dr. Amy Rodman, analyzing the Nasca ceramics in the Uhle collection at the Lowie Museum, UC Berkeley, 1990-1991

PUBLICATIONS

2018 The Tiwanaku Style in Cochabamba: How "Derived" Was It? In *The Southern Andean Iconographic Series*, edited by William Isbell, Mauricio Uribe, Anne Tiballi and Edward Zegarra, pp. 239-274. Cotsen Institute of Archaeology Press, University of California Los Angeles, Los Angeles.

2013 Tiwanaku Influence on the Central Valley of Cochabamba. In *Visions of Tiwanaku*, Monograph 78, edited by Alexei Vranich and Charles Stanish, pp. 87-112. Cotsen Institute of Archaeology Press, University of California Los Angeles, Los Angeles.

2009 Tiwanaku Influence on Local Drinking Patterns in Cochabamba, Bolivia. In *Drink, Power and Society in the Andes*, edited by Justin Jennings and Brenda J. Bowser, pp. 167-199. University Press of Florida, Gainesville.

2005 La Expansión Tiwanaku en Cochabamba: Resultados de excavaciones recientes en el Valle Central, *Memoria de las Jornadas Arqueológicas, Primera Versión, Sucre – Mayo 2004*, Centro de Investigación Arqueológica, Sucre, Bolivia.

1994 "Report on the Excavation at the Parochial Building, Quillacollo, Bolivia (June-July 1993)". Co-authored with Ricardo Céspedes and Ramón Sanzetenea. Unpublished excavation report presented to the Archaeological Museum of the Universidad Mayor de San Simón, Cochabamba, Bolivia.

DOCUMENTARY

2012 Consultant for "Tiwanaku" segment in *Lost Empires of South America Series*, British Broadcasting Company, BBC.

SELECTED PAPERS AND LECTURES

2015 "Transformation and Continuity: Late Tiwanaku to Post Tiwanaku Traditions in the Central Valley of Cochabamba". Paper presented at a symposium of the 80th annual meeting of the Society of American Archaeology, San Francisco, California.

2012 "New Radiocarbon Dates for Cochabamba". Poster presented at the 77th annual meeting of the Society of American Archaeology, Minneapolis, Minnesota.

2010 "Late Formative through Late Horizon Occupation Patterns in the Central Valley of Cochabamba". Paper presented at the 75th annual meeting of the Society for American Archaeology, St. Louis, Missouri.

2009 "Tiwanaku Influence on Local Social Identity in the Cochabamba Central Valley". Paper presented at the 74th annual meeting of the Society for American Archaeology, Atlanta, Georgia.

2007 "The Cochabamba Tiwanaku Style: How "Derived" Was It?" Paper presented at the Southern Andean Iconographic Series Colloquium in Pre-Columbian Art and Archaeology, sponsored by Dumbarton Oaks, the Cotsen Institute of Archaeology, University of California Los Angeles, the Universidad de Chile, and the State University of New York, Binghamton at the Universidad de Chile, Santiago.

2007 "Variety and Transformation: Tiwanaku Impact on Local Mortuary Practices at Piñami, Cochabamba, Bolivia". Paper presented at the 72nd annual meeting of the Society for American Archaeology, Austin, Texas.

2006 "Tiwanaku Impact on the Cochabamba Region: Household Evidence from Piñami". Paper presented at the 71st annual meeting of the Society for American Archaeology, San Juan, Puerto Rico.

2004 "Desarrollo local y el impacto Tiwanaku: el Formativo Tardío hasta el Intermedio Tardío en el valle central de Cochabamba". Paper presented at the I Congreso de Arqueologia de Bolivia, La Paz, Bolivia.

2004 "La Expansión Tiwanaku en Cochabamba: Resultados de excavaciones recientes en el Valle Central". Paper presented at the *Convocatorio de Jornadas Arqueológicas,* Universidad Mayor de San Xavier, Sucre, Chuquisaca.

2004 **"**Tiwanaku Expansion in the South Central Andes: Results from Recent Excavations at Piñami". Paper presented at the 44th annual meeting of the Institute of Andean Studies, University of California Berkeley.

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1999 "Tiwanaku Political Economy: The View from Cochabamba". Paper presented at the 64th annual meeting of the Society for American Archaeology, Chicago.

1998 "Tiwanaku and Local Effects of Contact: The Late Formative to Middle Horizon Transition in Cochabamba, Bolivia". Co-authored paper with Ricardo Céspedes and Ramón Sanzetenea presented at the 63rd annual meeting of the Society for American Archaeology, Seattle, Washington.

1996 "Omereque: a Middle Horizon Ceramic Style of Central Bolivia". Paper presented at the 61st annual meeting of the Society for American Archaeology, New Orleans, Louisiana.

1993 "The Early Intermediate Period to Middle Horizon in Cochabamba, Bolivia: Excavation in Quillacollo". Paper presented at the 33rd annual meeting of the Institute of Andean Studies, University of California, Berkeley.

OTHER PROFESSIONAL EXPERIENCE

Archaeological Experience

2002-2007 Bolivia -- Project Director for excavation at Piñami, a habitation mound in Cochabamba, Bolivia. Analyzed, catalogued and organized excavation collection in coordination with Cochabamba Archaeological Museum. Project Director for University Research Expedition Program (2004 and 2005), excavating at Piñami. Directed teams of UREP volunteers and gave instruction in excavation and analysis techniques.

Summer 1997 Bolivia -- Reconnaissance of prospective fieldwork area and follow-up analysis of 1993 excavation materials.

Summer 1996 Peru -- Participated in a systematic survey of the Nasca, Taruga and Las Trancas Valleys. Director: Dr. Katharina Schreiber.

Summer 1995 Ecuador -- Assistant director of University of California Research Expedition Program project excavating the Inca site of Rumicucho. Helped direct two teams of UREP volunteers and gave instruction in excavation and analysis techniques.

1993-1994 Bolivia -- Co-directed the excavation of a habitation mound in Quillacollo, Bolivia (excavation under the auspices of the Archaeological Museum of the Universidad Mayor de San Simón of Cochabamba, Bolivia); analyzed excavation materials and prepared excavation report.

1992-1993 Bolivia -- Art historical analysis of museum collection of Omereque style ceramics found in the Archaeological Museum of the Universidad Mayor de San Simón of Cochabamba, Bolivia.

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Studies in Complex Societies, Culture Contact and Ceramic and Residue Analysis with Professor Stuart Tyson Smith

ABSTRACT

Vessels, Burials and Households:

Piñami's Evidence of the Tiwanaku State in the Central Valley of Cochabamba

by

Karen A. Anderson

In the middle of the flatlands of the Cochabamba Central Valley of Bolivia, Piñami, one of many habitation mounds in the valley, is exceptional for producing some of the most extensive Tiwanaku-era evidence from Cochabamba. Over the course of five years, I led an international team in the excavation of a multigenerational mound at Piñami. The excavation yielded over 92,000 ceramics (including potsherds and entire vessels), over 60 funerary contexts, architectural and other household evidence, and four new radiocarbon dates. This dissertation considers the implications this rich mass of evidence has on questions of Central Valley chronology and of Tiwanaku influence on Cochabamba.

The findings at Piñami demonstrate the great impact of Tiwanaku on the Central Valley in ceramics and drinking practices, mortuary rituals, and economic and household activities. I use ceramic evidence to argue that the association between the Central Valley and Tiwanaku was strong by the Piñami Phase and that decorated fineware expressed materially and symbolically the transformation of local social identities.

Piñami mortuary evidence also reflects the substantial impact of Tiwanaku on the Central Valley as seen in changes in body position, vessel offerings and tomb construction. Further, I use cranial deformation and strontium isotope studies to support a hypothesis of an ethnically diverse population at Piñami that shared the same mortuary space. Finally, I use a variety of household evidence to show the impact of Tiwanaku on daily life at Piñami and to present a picture of a shared essential cosmology with Tiwanaku.

As for the nature of Tiwanaku expansion, I argue that Tiwanaku had more corporate state than exclusionary state characteristics: locals actively incorporated a Tiwanaku identity, and markers of Tiwanaku culture were widespread rather than restricted to elites. Further, the strong evidence of local response unearthed at Piñami, showing in a variety of ways the adoption of styles, technology, customs, symbols and everyday household items, supports the view of indirect control and the exercise of soft power in Tiwanaku expansion.

Piñami evidence also refines Central Valley chronlogy both by showing artifact changes over time and by providing new radiocarbon dates that more definitively tie Central Valley chronology to Tiwanaku. In short, this dissertation demonstrates that the Central Valley was of great importance to Tiwanaku for hundreds of years and aims to fill a vital gap in Tiwanaku studies that have underestimated Cochabamba in models of Tiwanaku expansion.

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Chapter 1: Introduction

In the Andes highlands of Bolivia, the state of Tiwanaku, centered south of Lake Titicaca, dominated from AD 500 to 1100 (Janusek 2008). Its influence extended into surrounding peripheries, including into the fertile Cochabamba valley system some three hundred kilometers to the southeast. In the middle of the flatlands of the Cochabamba Central Valley, Piñami, one of many habitation mounds in the valley, was occupied from the end of the Late Formative to the Colonial period and is exceptional for producing some of the most extensive Tiwanaku-era evidence from Cochabamba. From 2002 to 2006, I led an international team in the excavation of Piñami. Though the site, originally mapped at three hectares in size (Céspedes Paz 2000), had by 2002 been reduced to a quarter hectare due to urbanization, it nonetheless yielded a wealth of data. The evidence sheds light not only on the day-to-day life of the Piñami people but also on the relations of the Central Valley populations with the people of Tiwanaku. Further, Piñami's extensive occupations allow a diachronic approach to the examination of Tiwanaku influence.

My dissertation poses two central questions. First, what does the evidence from Piñami reveal about Cochabamba, about Tiwanaku and about the relationship between the two? Second, how can evidence from Piñami help to refine the chronology of the Central Valley?

This chapter begins with a brief introduction to Piñami's geographical setting, drawing particular attention to the variation within the Cochabamba Valleys and to the uniqueness of the Central Valley. It continues with a more detailed introduction of the Piñami site and the Piñami Project (*Proyecto Arqueológico Piñami)*. The chapter concludes with an overview of the dissertation.

Geographical Setting and Characteristics

The Andean region is a zone of dramatic geographic contrasts, from the deserts of the western coast to the high mountains of the Andean range to the low altitude tropical jungles to the east. The widest part of the Andes, from mid-Peru through northern Chile and Argentina, contains a wide, flat plateau between two higher mountain ranges or *cordilleras* (Figure 1.1). This plateau, known as the *altiplano,* or high plane, has elevations of 3000 to 4000 meters above sea level. Lake Titicaca, the largest lake in South America, is located in this high plateau. Many of the most expansive pre-Colombian states and empires of South America, including the Inca, Huari and Tiwanaku, developed in the *altiplano,* though each took advantage of lower elevation zones for crops and goods not available in the highlands (Janusek 1994, 2004; Schreiber 1992; Stanish 1992). The Cochabamba region is located in a mid-level elevation zone. Located on the eastern flank of the Andes to the south and west of Tiwanaku, the Cochabamba valley system extends almost 200 km east to west. These valleys are located in a zone where the Andes begin their

descent to the tropical lowlands and range in altitude from ~2650 meters above sea level in the west to ~1600 meters above sea level in the east.

Cochabamba

The name "Cochabamba" is ambiguous. It can refer to the department of Cochabamba, to the city of Cochabamba or to the loosely-connected intermontane valleys that make up the enormous Cochabamba valley system (Figure 1.2). Such a large area, with many of the valleys somewhat isolated from each other, should not be assumed to be a single political or cultural region. Subregional variation must be taken into account when drawing conclusions about the character of "Cochabamba". Two examples that illustrate this point are textile specialist Amy Oakland's studies of textiles from Omereque Valley cave sites (1986) and physical anthropologist Tyler O'Brien's analysis of skulls from a cave in the far valley of Mojocoya (2003). Oakland found that the majority of Middle Horizon textiles used local rather than Tiwanaku techniques, and O'Brien found that the majority of skulls showed few highland traits. Their findings led each to a conclusion of low Tiwanaku influence that is completely consistent with the ceramic data for those regions. As persuasive as their arguments are, it would be inaccurate to apply their conclusions from the far valleys to the entire Cochabamba valley system, which stretches for hundreds of kilometers. In this dissertation, I will demonstrate that there was high Tiwanaku influence in the Central Valley of Cochabamba.

To address the geographic variation, I divide the Cochabamba region into three major zones. Closest to Tiwanaku are the Western Valleys: the Central, High, Sacaba, Capinota, and

Santivañez valleys. The Western Valleys are adjacent and interconnected. Two of them, the Central Valley and the High Valley, are enormous (see Figure 1.3). Approximately 120 km to the east are the Eastern Valleys: Mizque, Pocona, and Aiquile. Finally, 60 to 80 km farther east are the Far Valleys, narrow valleys along the Río Mizque, Rio Grande and smaller rivers. Both the Eastern Valleys and Far Valleys are quite small and separated from each other by significant distances.

Uniqueness and Importance of the Central Valley

Even among the Cochabamba Western Valleys, the Central Valley is unique. It was and still is the most agriculturally productive and populated valley in the Cochabamba region (Honorable Municipalidad de Cochabamba 2005). The city of Cochabamba, the capital and most populated city in the region, is located in the Central Valley. Further, the Central Valley is one of the two largest Cochabamba valleys, similar in size to the Tiwanaku Valley and substantially larger than other Tiwanaku peripheries such as Moquegua (Table 1.1). The Central Valley's many advantages led to its becoming the valley most directly controlled by the Inca and Spanish empires (Wachtel 1982).

Table 1.1. Comparison of Valley Size and Distance from Tiwanaku.

Region	**Specific Valleys**	**Distance from Tiwanaku in km***	**Approx. Valley Area in km^{2} ****	**Hectares under Cultivation Today**
Cochabamba	Central	270	340	29,000 ha.
Western Valleys	Capinota	280	80	(Ha. Muni. de

	Santivanez Sacaba High	280 290 315	60 50 350	Cochabamba 2005) -- --
Cochabamba Eastern Valleys	Aiquile Mizque Pocona	370 385 415	40 75 70	-- -- --
Cochabamba Far Valleys	Omereque Saipina	440 470	<20 50	-- --
Moquegua Valley	Middle Moquegua	255	85	3,300 ha (Goldstein 2005)
Tiwanaku Valley	Tiwanaku	0	350	

*Distances are from the site of Tiwanaku to the center of the named valley based on Google Earth measurements.
**Valley sizes are also based on Google Earth measurements of each valley.

The Central Valley was the best-watered of the major Cochabamba valleys. The higher mountains to the north, reaching over 4000 meters above sea level, produced year-round run-off. A high percentage of the Central Valley flatlands was kept fertile due to regular flooding, and there is evidence of prehistoric wetlands and a lake covering a large portion of the flatlands. Indeed, the name "Cochabamba" comes from the words "*qocha*" or lake and "*pampa*" or plain (Döllerer 2013:431). In addition to having excellent conditions for agricultural productivity, the Central Valley is bordered by mountains to the north that provided access to high elevation grazing areas for camelids (Figure 1.3). Further, as was also the case with other Western Valleys, the Central Valley was crossed by multiple key trade routes.

Finally, a unique feature of the Central Valley is its high frequency of multigenerational habitation mounds (Céspedes Paz et al. 1994:3, map 3; Gabelmann 2012a:30). Based on surveys of various Cochabamba valleys, Gabelmann noted that the Central Valley had a substantially higher percentage of long-term habitation mounds than did other Cochabamba valleys and that these multigernerational mounds were in valley flatlands in areas prone to flooding As I note in

Chapter 3, I also believe that the location of the Central Valley flatlands in a flood zone is one factor in how Piñami came to be such a rich, multigenerational site.

Piñami Site Background

In the 1970s, Bolivian archaeologists from the state university archaeological institute, *Instituto de Investigaciones Antropológicas y Museo Arqueológico, Universidad Mayor de San Simón* (INIAM UMSS) mapped a cluster of three mounds, each about three hectares in area, in the center of the Central Valley in the valley flatlands (Céspedes Paz et al. 1994, Map 2). This cluster was designated Piñami, with a site number of Q-1. Two of the Piñami mounds soon disappeared due to urbanization pressures. The remaining mound, also at risk of disappearing completely, was first excavated in 1988 by Céspedes Paz as a salvage excavation. The excavation uncovered substantial numbers of Middle Horizon and Late Intermediate Period burials with numerous grave offerings. Due to the numerous burials, Céspedes Paz considered Piñami a burial mound (Céspedes Paz 2000).

The richness of the remains enabled INIAM to have the mound designated patrimony of the state, and further demolition was prohibited pending further excavation. However, as no additional funding was available and excavation was suspended, Piñami was slowly chipped away and a community grew up around the mound. By 2001, all that remained of the original 3-hectare site was a 30 by 60 meter (or ~.2 ha) area (Figure 1.4). At that time, the local community, (OTB Quechisla), after waiting thirteen years for

further excavation, finally obtained permission to have the mound removed by working in conjunction with INIAM staff archaeologists. The local public works department, PLANE, would provide the labor. PLANE is typically tasked with accomplishing public works (for example, paving roads) at a given rate, so the demolition team was assigned a rate of cubic meters of the mound to be removed each day, no matter what the findings.

INIAM set up two large side-by-side sectors, Sectors A and B, each ~ 10 by 15 meters in size. The PLANE team excavated each sector by levels of an arbitrary thickness of 20 cm. No staff archaeologist from INIAM was available to supervise on site, so Juan Carlos Blanco, a non-archaeologist who had assisted the staff with excavations in the past, was given the responsibility of supervising the entire salvage excavation at Piñami, including direct supervision of Sector A. A university student with little prior experience supervised Sector B under him. Each sector had at least seven to ten workers using picks, shovels and wheelbarrows for excavating and moving the material. They screened some of the dirt through chicken wire and bagged the materials by sector and level. Minimal records were kept and grave offerings were grouped according to excavation level rather than by gravelot. Very few photos were taken.

In 2001, I arrived in Bolivia with a research plan to do a site survey in the Central Valley. However, the Director of INIAM, David Pereira Herrera suggested I instead 32excavate at Piñami since it was such a rich Middle Horizon site and was about to be demolished. After consultation, my advisor and I agreed that this would be an excellent opportunity that would continue to meet my established research design.

Proyecto Arqueológico Piñami – Research Design and Methodology

The Piñami Project, designated *Proyecto Arqueológico Piñami*, was originally intended as a one-year project funded by the National Science Foundation but was extended to a second year due to funding from National Geographic. The project was further extended into two additional summer seasons in 2004 and 2005, thanks to support from UREP (University of California Research Expedition Project). A final season of analysis occurred in 2006. The following summary and accompanying table (Table 1.2) characterize the five phases of the project and set out the methodology used.

Phase 1: Finalize Excavation Site and Assist PLANE

Before we could begin our intended task of horizontal excavation, there was substantial work to be done due to the limitations of the PLANE excavation. When my co-director, Zulema Terceros Cespedes, and I arrived at Piñami to set up our excavation unit (Sector C), we were surprised to see that numerous burials were being excavated in Sectors A and B with no methodical recordkeeping. The PLANE team was already at Level 11 or 12. Under the direction of INIAM Director Pereira Herrera and with the consent of the on-site excavation supervisor, Juan Carlos Blanco, my co-director and I recorded, photographed and analyzed each burial and preserved the integrity of the majority of gravelots excavated by PLANE subsequent to my arrival. Director Pereira Herrera gave me permission to analyze the materials from these gravelots. We used burial recording

forms I had specifically adapted and brought along for this project. The burial information proved to be an invaluable resource.

We worked with the PLANE team for about two months until their project funding ran out. At that point, neither Sector A nor B had reached sterile.

Phase 2: Preliminary Horizontal Excavation – Sector C

The Piñami Project set up an 8 by 10 meter unit to the west of Sector B in the only large unexcavated portion of the mound. We designated it Sector C (Figure 1.5). Based on results of prior excavations that had concluded Piñami was solely a mortuary site, we expected to be able to move rather quickly through the sector. Our excavation followed natural layers across the 8 by 10 meter unit, which was subdivided into 2 by 2 meter units. Two Bolivian archaeology students (one of whom was my co-director, Zulema Terceros Cespedes) and a team of eight workers assisted in the excavation.

Contrary to our expectations, Piñami was not only a burial mound but also a habitation mound. We were surprised to encounter Late Intermediate occupation buildings almost immediately. Starting at Level 5, we encountered Middle Horizon style artifacts associated with architecture. It is likely that the reason the earlier salvage excavations missed the evidence of buildings was that almost all the walls from both the Late Intermediate and the Middle Horizon were made of poured mud, *tapia,* without stone foundations.

The Middle Horizon building we encountered in Sector C was quite complex, with agglutinated rooms and specialty rooms showing numerous renovations and multiple

features that had not been previously identified in the Cochabamba region. Followingnatural levels across the site proved to be quite difficult due to the numerous building renovations and due to large intrusive pits made during later occupations.

When we closed the site for the winter, I consulted with my advisor concerning the increasingly clear richness and variety of the site and the threat of imminent destruction. My advisor assisted me in obtaining additional funding from National Geographic to supplement the National Science Foundation Grant to extend the project.

Phase 3: Horizontal and Vertical Excavation

The bulk of the excavation occurred in Phase 3. After the rainy season, we restarted the project in 2003 with a larger team and a two-fold goal. Our first goal was to get a better understanding of Middle Horizon architecture in Sector C. To better control for the complexity of the site, we switched to a Harris Matrix method of excavation and expanded the unit to the east and north to get a more complete picture of the large building that extended past the original boundaries of Sector C. Chapter 7 discusses my architectural findings.

Our second goal was to determine the full ceramic chronology of the site with special attention to the transition from Late Formative to Middle Horizon. I was particularly interested in whether I would observe the same pattern of stylistic change in ceramics at Piñami as Céspedes Paz and our team found at Quillacollo (Céspedes Paz et al. 1994). It was clear from early on that excavating the entirety of Sector C to sterile would not be feasible due to the complexity of the architecture. Instead, to get a fuller

ceramic chronology and to look for evidence of stylistic change, I chose to excavate a 2 by 4 meter unit to the east of Sector A. This unit had the advantage of having one profile almost completely exposed by the PLANE excavation of Sector A, so we could see the stratigraphy before excavation and we could excavate without being deep in a pit. This unit was designated A-1 (Figure 1.6**).** Our goal for A-1 was to reach sterile and we were able to do so with a total profile of 4.2 meters from mound surface to sterile[1].

Phase 4: Early Features, Burials and Special Analyses

In 2004 and 2005, we had short summer excavation seasons supported by UREP (University Research Expedition Program) that targeted unfinished goals from the prior seasons. We focused on excavating specific features that would give us information on Tiwanaku influence at the site at the beginning of Middle Horizon (i.e., the transition from the Late Formative to the Illataco Phase). Unfortunately, we found very little Illataco material in Sector A-1. We were, however, able to determine from some features excavated at the bases of Sectors A and B that there had been some Illataco and likely Late Formative occupation at Piñami. To fill in this gap, we set up two 2 by 2 meter pits in Sector B that did provide us with material from Late Formative contexts. We also excavated the Sector A Illataco Phase features left unexcavated by PLANE. These features included burials, large hearths and garbage pits, and they greatly expanded our Illataco Phase information.

In Phase 4 we also completed the excavation of the human remains from the burials not fully excavated at the time that PLANE withdrew from the project. In their

final rush, the PLANE team had excavated only the ceramic artifacts from the burials, leaving the human remains. Physical anthropologist Bonnie Yoshida accompanied us and supervised the cleaning of the human remains from all sectors before completing her own in-depth analysis as to age, sex, health and cranial deformation. Her results are referenced extensively in Chapter 6 and in Appendix 2, and her report is included as Appendix 3.

Phase 5: Other Analyses

During 2006, we analyzed the excavated materials. These analyses included the following:

Ceramic Materials. Ceramics were the most numerically significant artifact found and are at the core of my analysis of temporal occupation and site growth. In all, we reviewed over 92,000 ceramics, including potsherds and entire vessels. The ceramics were washed, sorted, photographed and individually numbered by locus or level and unit. Decorated sherds were analyzed as to style, and the stylistic designations formed the basis for the core chronology of the site.

Flotation Samples. We gathered 2,399 flotation samples which were then floated under the supervision of Zulema Terceros Cespedes as part of her thesis on the botanicals of Piñami. The remaining heavy fraction, including macrobotanicals, bones, shells, lithics, metal and ceramics, was sorted, weighed and analyzed by the Piñami Project.

Isotope analysis. Samples of human remains from Piñami and, for comparison, samples of rodent remains from Piñami were sent to Corina Kellner for isotope analysis

(see Chapter 6 for results and detail) (Kellner 2010). In addition, bone and teeth samples were sent to Kellner and Christine Lucas for strontium analysis. Lucas used the material for her master's thesis under the supervision of Kellner (see Chapter 6 for results and detail) (Lucas 2012).

Summary of Research Design and Methodology

A summary of the excavation by phase, identifying methods, goals and time periods is set out in Table 1.2, below.

Table 1.2. Piñami Project Research Design and Methodology.

Phase	**Sector**	**Excavation Method**	**Investigative Goal**	**Time Periods**
1	Sectors A and B	~20 cm arbitrary levels (conducted by PLANE)	Assist PLANE to register, photograph and sort gravelots	Piñami to Illataco Phase
2/3	Sector C	Natural levels at first; due to complexity of site, transitioned to Harris Matrix for remainder of excavation	Develop site chronology; extend focus to household building layout and technique after finding significant architecture	Colonial, Late Intermediate Period and Piñami Phase
3	Sector A-1	Locus/Harris Matrix	Develop ceramic chronology	Colonial through Illataco Phase
4	Sector B 2 by 2 test excavations	Locus/Harris Matrix	Expand ceramic chronology covering the Late Formative to Illataco Phase transition	Piñami Phase to Late Formative to sterile

4/5	Sectors A and B features and burials	Harris Matrix within feature, tied to PLANE 20 cm arbitrary levels where possible	Obtain more information on Illataco to Piñami transition, expand burial population	Piñami to Illataco Phase
All	Burials found on exterior of units	Harris Matrix within feature, tied to stratigraphy of site where possible	Expand burial population and protect material from looters (all burials that came to light outside the excavation units were excavated)	Piñami Phase

The overarching research methods employed in the Project were as follows:

- A grid was laid out over the site with the datum point in the far southwest corner of the site. Excavations units were 2 by 2 meters in size.
- Natural levels were used in Phase 1, but due to the complexity of following natural levels at the site, the Harris Matrix locus system was used from 2003 to 2005.
- Arbitrary levels were used only in areas where the material was disturbed to the point that excavating by natural levels was not possible or where we had reached sterile and were excavating the substrate.
- Features were excavated individually and assigned feature locus numbers.
- Two-liter flotation samples were taken at each level or locus. If the entire locus was less than 2 liters of material, we saved the entire sample for flotation.

- During excavation we screened all dirt using 5mm mesh screen. For special finds, such as tombs, ash lens or hearths, we used a 2 mm screen.
- After initial screening, artifacts were sorted as ceramic, lithic, bones, worked bones, macrobotanicals, marine shell, metal wood or other finds. All bags were numbered and recorded in a register.
- Samples were preserved for radiocarbon analysis when suitable large pieces of carbon from clearly undisturbed contexts were encountered.

Excavation forms were filled out for each level, feature and locus. In addition, specialty excavation forms were used for architecture, burials and tombs types.

After five years, the *Proyecto Arqueológico Piñami* concluded, having yielded an enormous amount of material valuable for the study of Cochabamba. Over the course of several years after the project's conclusion, I worked with the local community to create a site museum at Piñami and to protect the site.

Overview of the Dissertation

In Chapter 2, I consider theoretical models for the study of state expansion and the nature of a state's interaction with its peripheries. I draw particular attention to a model put forward by Blanton and colleagues that I find useful for the case of Tiwanaku and Piñami. I also consider the question of local response to a state and its ideology, practices and material culture.

Chapter 3 focuses on chronology and begins with an overview of the chronology of Tiwanaku and the Southern Titicaca Basin. Next, I review prior research in the Cochabamba valleys before presenting a chronology of Piñami based on evidence from my excavations. Most importantly, this chapter introduces four new radiocarbon dates from Piñami and discusses the implications of those dates for the Middle Horizon chronology of Cochabamba and for the expansion of Tiwanaku into Cochabamba.

The next four chapters consider the influence of Tiwanaku on the Central Valley. Chapters 4 and 5 examine ceramic evidence. Chapter 4 introduces the Central Valley Cochabamba Tiwanaku style (CVCT) and argues that there was a high degree of Tiwanaku influence and a willing adoption of Tiwanaku traits. Chapter 5 explores the extent of Tiwanku influence through a consideration of *chicha* drinking, presenting evidence on the increased quantity of Tiwanaku style drinking cups in domestic areas and burials and examining changes in drinking rituals that reflect Tiwanaku influence.

Chapter 6 presents and examines mortuary evidence. Tiwanaku influence is assessed based on changes in burial traditions such as offerings, position of the deceased and tomb construction techniques. In addition, this chapter uses specialized physical bioarchaeological analyses to address questions of ethnic identity and origin of the population of Piñami, as well as the larger question of the movement of people in the Central Valley in the Middle Horizon.

Chapter 7 considers the extent of Tiwanaku influence in other artifact classes such as architecture and household features, utilitarian ceramics and diagnostically Tiwanaku artifacts. It also considers evidence of *maize* and camelids as key food items and examines evidence of the intensification of food production.

Chapter 8 concludes this study, summarizing the findings of the Piñami excavation and the ways in which those findings answer the two lines of inquiry set out above. It gives evidence that argues for a refined chronology of the Central Valley, demonstrates the strong impact of Tiwanaku on the Central Valley and in turn deepens our understanding of the Tiwanaku state itself. This work fills a vital gap in Tiwanaku studies that have underestimated Cochabamba in models of Tiwanaku expansion and peripheries.

[1] A third goal had been to integrate the stratigraphy from the various excavation sectors, integrating information from PLANE with our own findings. However, an interruption in the stratigraphy caused by an enormous intrusive colonial pit prevented us from doing so.

Table List for Chapter 1

Figure List for Chapter 1

Chapter 2: Theory – Consideration of State Development and Expansion

One approach to characterizing the nature of a state's power is through the examination of that state's interactions with its peripheries. Periphery studies provide insight into the organization, values and sources of power of the state, as well as the extent and limits of its influence and control, by examining what characteristics of local identity remain intact and what characteristics change (Chase-Dunn and Hall 1991; Shortman and Urban 1994; Stein 1998).

A number of theoretical models exist for the study of state expansion and the nature of a state's interaction with its peripheries. Some models focus on matters of organization, such as the extent to which a state is hierarchical or heterarchical, centralized or segmentary; other models may focus on the degree of control exercised or on the movement of populations from a state to its periphery. Another type of model considers questions of expansion from a different perspective, asking how local populations respond to the encroaching state (is the state met with acceptance, resistance or a combination of the two?). This chapter considers three models of particular importance for this dissertation: the direct vs. indirect control model, the corporate vs. the exclusionary state model, and the model of local response.

Models of State Expansion

Direct Control vs. Indirect Control

An important model for state expansion considers the question of how control is established: is it established through intimidation? through military efforts and the use of garrisons? through negotiation, cooperation with elites and other diplomatic efforts? In other words, how direct is the control?

Direct control means that expanding states incorporate territory through military conquest and "efficiently extract tribute from [that] territory by--literally--eliminating the middleman, as local political leadership is replaced by an imposed administration.… Territorial integration relies on imposed institutions to manage unemployment, population stress, and elite population pressure with maximum efficiency" (Goldstein 2005:12). Indirect control, by contrast, incorporates territory hegemonically, "using indirect political, economic, and ideological mechanisms as a way to reduce the costs and risks of regulation" (Goldstein 2005:12). Schreiber points out, "diplomacy incurs much lower expense, and fewer people are involved. If a small group of imperial emissaries can persuade the rulers of a local polity to enlist in the imperial cause, then the expense of battle and rebuilding is avoided. Maximum benefit derives both to the empire and to the local polity" (Schreiber 1992:10). Indirect control may use techniques such as negotiation, intimidation and attraction, and it may be largely psychological. For these reasons, evidence for indirect control is much less obvious archaeologically than evidence for direct control, which could include, for instance, remains of outposts, of

state administrative centers or of new roads or other infrastructure. Even where evidence exists, it can be difficult to evaluate. Schrieber writes:

> Evidence for militarism in the archaeological record may be seen in the existence of fortified sites, both local and imperial, as well as actual weapons. Evidence of physical trauma in human remains may also indicate direct conflict. However, evidence of military action may or may not pertain to the imperial takeover; it may equally well pertain to the local situation immediately prior to the advent of the empire. And evidence of a military presence does not tell us whether or not military confrontation actually took place. Diplomatic missions leave little direct evidence (Schreiber 1992:12).

Beyond these difficulties of assessing evidence, to the extent that it exists, it is also necessary to keep in mind that elements of direct control and elements of indirect control are not mutually exclusive and their relative importance may shift over time.

Higueras Hare's Model. In attempting to characterize Tiwanaku expansion into Cochabamba, Alvaro Higueras Hare postulated that if Tiwanaku expanded into the Cochabamba region in order to control it, it was for the purpose of increasing agricultural production, as has been noted in the expansion of the Inca and Spanish empires (Higueras Hare 1996; Wachtel 1982). He suggested that key markers of control and of intensification would be changes in habitation locations to areas closer to the best maize growing zones. Movement of habitation locations closer to maize zones or to other desired resources had been noted within the Inca and Wari empires (Schreiber 1992; Wachtel 1982). To test his hypothesis, he surveyed two Cochabamba valleys: the Capinota Valley in the Western Valleys and the Mizque Valley in the Eastern Valleys (see map, Figure 1.3). He found that from the Late Formative to the Middle Horizon there was overall no statistically significant relocation of habitation site locations toward maize growing zones. He concluded that Tiwanaku had not controlled or significantly affected the political economy of the Cochabamba valleys during the Middle Horizon;

rather, he proposed that the Late Formative *status quo* had continued and the presence of Tiwanaku style ceramics was merely the result of a diffusion of traits unrelated to political change (Higueras Hare 1996).

My own conclusion is different. Since Higueras Hare did not excavate, he based his conclusions on site locations only and he could not address the use and production of maize or other aspects of daily life that would indicate Tiwanaku influence and impact. In the following chapters, I set out a wider range of evidence to explain why I have concluded that the *status quo* did not continue, that the presence of Tiwanaku style ceramics did reflect changes in the political economy and that Tiwanaku did have a multi-faceted impact on Cochabamba.

Exclusionary vs. Corporate State

I find that a model put forward by Blanton and colleagues is particularly useful for examining relations between Tiwanaku and Cochabamba. In this model, states range along a continuum from exclusionary to corporate states (Blanton 1998; Blanton et al. 1996). In exclusionary states, "power wielders have few restrictions on their exercise of power" (Blanton 1998:147). Power is centered in the hands of individuals who dominate a bureaucracy or networks of subordinates. These states often have a cult of personality such that images of the ruler or other reminders of the ruler's name, conquests and power are displayed overtly as state propaganda, with rulers often buried in ostentatious royal tombs. In exclusionary states, it is common for elites to gain power by proximity to the ruler and by acquiring prestige goods which are rigorously restricted to elites and not

available to commoners. Exclusionary states are found archaeologically rather easily due to their ostentatious royal burials, palaces, elite compounds, restricted access to prestige goods and limited production of state styles. Exclusionary states might exercise direct control of a periphery through military efforts but might alternatively or additionally exercise indirect control through alliances with local elite who would in turn gain status and have access to state prestige goods not available to the general population.

On the other end of the continuum is the corporate state. In corporate states, the ruler or governing body has power but is constrained by ritual obligations, laws or bureaucracy. There are seldom images of a specific ruler or ostentatious royal tombs, and specialty goods tend to be widely distributed and available throughout the population. A corporate state often rules by assembly rather than despotically and reflects a greater emphasis on "soft power" via attraction and use of inclusive rituals. Personal status is increased through moral and ritual performance rather than through the acquisition of prestige goods. Such ritual practices can be extended to households of all social statuses (Blanton 1998:160). In corporate states, assimilation into state cultures may be expressed at a household level. Such assimilation may be seen in larger, more differentiated family compounds or by encoding more complex symbolism in living spaces via household alignment to cosmic symmetries, use of household shrines or more extensive ritual paraphernalia (Blanton 1998:168). State style artifacts are often widespread. Corporate states allow for decentralized local production of symbolic artifacts rather than limiting production and distribution of such artifacts. This allowance may result in local variability in expression of the state style.

Blanton and colleagues point out that both exclusionary and corporate states can be powerful and enduring, but powerful, *corporate* states can be harder to identify archaeologically due to the lack of palaces, elite goods and royal burials. Thus, their archaeological correlates may be interpreted as those of a weak or fragmented state. Indeed, Blanton and colleagues argue that corporate states may be large, highly integrated, powerful and long-lasting (Blanton et al. 1996:3).

Exclusionary and corporate states are not mutually exclusive but rather situated on opposite ends of a continuum with a dynamic dialectic between individuals and groups pushing for greater exclusionary power and others pushing back toward more decentralized, corporate power. As a result, a state may move back and forth over time between a more exclusionary mode and a more corporate one. The corporate-exclusionary model thus provides a framework for evaluating changing power relations and ideological and political shifts over time.

Local Response

A different type of model for understanding the nature of state expansion examines local response to that state and its ideology, practices and material culture. This type of model considers such things as the local adoption of symbols and ideology of a foreign culture, economic changes, and changes in everyday practices, including feasting and mortuary practices (Dietler 2001; Goldstein 2005; Janusek 2004).

Household studies are key in assessing local response as it may be at the household level that we find the clearest markers of local social identity and of changes

in everyday practices. Households are critical arenas for local decision-making that occurs during formal and informal visiting between neighbors. As Bowser found in her study of a small-scale, multi-ethnic community in Ecuador, markers of factions, ethnic identity and changing political alliances were conveyed nonverbally via subtle changes in *chicha* beer bowl style; messages were purposefully communicated and effectively "read" by visitors (Bowser 2000, 2002). My own excavations at Pinami also yielded valuable evidence from the intimate level of the household, where the decisions of individuals to adopt or resist foreign social identities may best be seen. In the following chapters, I will use household evidence to assess the nature of the relations between Tiwanaku and the local population.

Summary

Interacting societies leave material evidence corresponding to the ways in which those societies interact, but it is important to consider a wide range of material before drawing conclusions. At Pinami, I looked at a variety of evidence and considered what it might reveal about the nature of the interaction between Tiwanaku and Cochabamba. Was there evidence of direct control, such as forts or administrative centers? Were there prestige goods or sumptuary goods that could point to an exclusionary state, or were Tiwanaku goods and rituals more widespread, supporting the idea of Tiwanaku as a corporate state? What does the evidence of ceramic, morturary, architectural and household tools indicate

about local response to Tiwanaku? What evidence is there for a change in social identity or adoption of Tiwanaku symbols? In examining the rich results of my team's excavations, I considered these types of questions to better understand the nature of Tiwanaku expansion and the Tiwanaku state.

Chapter 3: Evidence as to Chronology

A key focus of the Piñami Project was to expand and refine local chronology and fix it more concretely within the regional Tiwanaku chronology. In this chapter I will briefly overview the chronology of Tiwanaku and the Southern Titicaca Basin and review, with an emphasis on chronology, prior research from the Cochabamba valleys. I will then present a chronology of Piñami based on evidence from excavations. Finally, this chapter introduces four new radiocarbon dates from Piñami and discusses the implications of these dates for the Middle Horizon chronology of Cochabamba and for the expansion of Tiwanaku into Cochabamba.

Prior Research and Traditional Chronology

In South Central Andean chronology, the Middle Horizon is defined by the expansion and domination of the Tiwanaku and Wari states seen in large part via the spread of state ceramic styles.[1] In Cochabamba, the Middle Horizon is preceded by a long Formative period, which is characterized by the development of chiefdom-level societies (Döllerer 2013) and the beginning of ceramic use (Brockington et al. 1985, Brockington et al. 1995). The Middle Horizon is

followed by the Late Intermediate Period, which is marked by socio-political change and by the abandonment of Tiwanaku style material.

In order to better understand developments in the Cochabamba Central Valley during the Middle Horizon, it is necessary to first review the Middle Horizon chronology of Tiwanaku and the Southern Titicaca Basin. Further, it is useful at this point to discuss the Tiwanaku periphery of Moquegua, located approximately 200 km to the west of Tiwanaku, since I will use it as a basis for comparison throughout the dissertation.

Chronology of Tiwanaku

In the Tiwanaku and Southern Titicaca Basin chronology (Table 3.1), the Middle Horizon begins with Tiwanaku IV, AD 500 to AD 800, with the development of the Tiwanaku state and the widespread use of polychrome redware ceramics. The Middle Horizon ends with Tiwanaku V, AD 800 to AD 1100, with the abandonment of the capital and the end of the Tiwanaku style polychrome ceramics (Janusek 2004).[2]

Tiwanaku IV and V are further subdivided into early and late phases. Early Tiwanaku IV, AD 500 to AD 600, sees the preliminary development of the Tiwanaku state, the growth of the capital of Tiwanaku and the first use of Tiwanaku redware ceramics. In Late Tiwanaku IV, AD 600 to AD 800, Tiwanaku leaders expand into selected areas with desired resources. Trade networks increase greatly. Tiwanaku V is a more expansive phase than Tiwanaku IV, with political power more consolidated and evidence of increasing hierarchy. During Early Tiwanaku V, AD 800 to AD 1000, Tiwanaku was at the height of its power and geographical spread through its peripheries.

Late Tiwanaku V, AD 1000 to AD 1100, is marked by increasing societal and environmental stress leading to a final breakdown of the state and depopulation of the Tiwanaku capital (Janusek 2008:23-24).

Table 3.1. Tiwanaku and Southern Titicaca Basin Chronology.

Time Period	Years
Late Horizon/Inca	AD 1450 to AD 1550
Late Intermediate/Pacajes	AD 1100 to AD 1450
Middle Horizon — Late Tiwanaku V	AD 1000 to AD 1100
Middle Horizon — Early Tiwanaku V	AD 800 to AD 1000
Middle Horizon — Late Tiwanaku IV	AD 600 to AD 800
Middle Horizon — Early Tiwanaku IV	AD 500 to AD 600
Late Formative	100 BC to AD 500
Middle Formative	800 BC to 100 BC

Chronology of Moquegua

To better assess how the chronology of Cochabamba fits into Tiwanaku state development and expansion, I would like first to look at Tiwanaku's expansion into another key periphery, Moquegua (see Figure 1.1). Moquegua is the periphery with the most extensive set of radiocarbon dates (Goldstein 2005).

Goldstein found two ceramic styles in Moquegua, the Omo and Chen Chen styles, that corresponded to two different enclaves. He determined that "the Omo and Chen Chen colonists coexisted within the same town sites (albeit in separate enclaves)" (Goldstein 2015:9205). The Omo style was characterized by both black polished and red-slipped and painted fineware (Goldstein 2005:151). The Chen Chen ceramic style

did not have polished blackware. Instead the fineware was entirely red-slipped polychrome ware with some stylistic features that distinguished it from the Omo style, including taller, more flaring *keros* and the presence of the flaring bowl *tazón* shape (Goldstein 2005:158). (See Chapter 4 for a full description of ceramic forms.)

The Omo occupation appeared somewhat earlier than the Chen Chen occupation. The one sigma range for radiocarbon dates from mo sites is AD 538 to AD 1030. However, Goldstein notes that "[t]he preponderance of Omo-style dates follow the major flood event in Moquegua dated to AD 700" (Goldstein 2005:152). The one sigma range for the Chen Chen occupation at Moquegua is AD 785 to AD 1000 (Goldstein 2005:158). Few of the Omo sites and none of the Chen Chen sites have been dated earlier than AD 700. In terms of alignment with the highland chronology, limited Omo occupation began as early as Early Tiwanaku IV, but both Omo and Chen Chen sites were occupied during Late Tiwanaku IV and throughout Tiwanaku V (Goldstein 2005).

Prior Research and Chronology—Western Cochabamba Valleys

In the early twentieth century, Erland Nordenskiöld, a Swedish archaeologist and anthropologist, first recorded sites in and ceramic styles from the Cochabamba region (Nordenskiöld 1953; Rydén 1959). In the mid-1930s, Wendell Bennett, an American archaeologist, began work in Cochabamba, including at the site of Arani in the High Valley, where he found evidence of Tiwanaku influence (Bennett 1936). He had previously worked at the type-site of Tiwanaku, where he identified two Middle Horizon phases based on Tiwanaku ceramic styles — a "Classic" Tiwanaku style and a later

"Decadent" style (Bennett 1934). At Arani, he identified two distinct versions of the Tiwanaku style that he felt were similar to the Classic and Decadent styles. However, the earlier of the two was distinct enough from the Tiwanaku Classic that he designated it "Derived". Bennett's work was highly influential in that it set the expectation of the relationship between Tiwanaku and Cochabamba. Bennett confirmed there was substantive contact, but his assertion that the ceramics showed only a *derived* influence was assumed to mean a more distant relationship than Tiwanaku had in other peripheries. (See Chapter 4 for my argument about whether the Cochabamba version of Tiwanaku should actually be considered derived.)

Beginning in the 1940s, Stig Rydén of Sweden, was able to refine chronological phases in Cochabamba based on changes in ceramics in gravelots. A key mound site in his study was Tupuraya, a multi-generation mound site in the Central Valley that has since been completely destroyed by urban expansion (Rydén 1959). Rydén is known for his impressive survey, detailed ceramic analysis and drawings, and tomb excavations in Bolivia and Peru.

Also beginning in the 1940s, Dick Edgar Ibarra Grasso, an Argentinian, identified ceramic styles throughout Bolivia and performed stylistic and temporal analyses based on ceramic traits (Ibarra Grasso 1973, Ibarra Grasso and Querejazu Lewis 1986). His analyses were focused on determining the pattern of diffusion of traits throughout South America and on determining the temporal phases of each region of Bolivia. Based on those determinations, he hypothesized the contact and influence between the regions of Bolivia. He considered Tiwanaku an empire that took over the Cochabamba region. His

ongoing significance is due to his detailed analyses and his numerous drawings of a large number of styles from throughout Bolivia.

In the 1980s and 1990s, Donald Brockington's research made a major contribution to our understanding of the Formative in Cochabamba. He undertook survey and excavations in a variety of valleys in Cochabamba, including the first significant excavations at the Central Valley site of Sierra Mokho. Brockington and his team were able to characterize the various phases of the Formative in Cochabamba using radiocarbon dates to identify major transitions. They also described various Formative ceramic styles throughout Cochabamba and made regional and temporal comparisons (Brockington et al. 1985; Brockington et al. 1995).

In that same period, Ricardo Céspedes Paz worked extensively in the Central Valley on site survey and excavations. Based on his findings, he made the important subdivision of the Middle Horizon into two major subphases: Illataco and Piñami (Céspedes Paz 2000). He characterized the Illataco Phase as a short transitional phase that began with the first appearance of Tiwanaku imported ceramics amid local assemblages. The Piñami Phase is a longer period when the local version of the Tiwanaku ceramic style was dominant (Céspedes Paz 2000). Céspedes Paz and I worked together at the Quillacollo site in the 1990s. That excavation led to further refinement of the Illataco and Piñami Phases (Céspedes Paz, Anderson and Sanzetanea1994).

These were the major contributors to Cochabamba chronology by the time of my arrival at Piñami in 2002. Table 3.2 sets out the chronological phases of Cochabamba and the general characteristics of each phase.

Table 3.2. Western Cochabamba Valley Chronology.

Time Period	Years	Social and Political Developments
Late Horizon/Inca	AD 1450 to 1550	Inca Empire dominates the region
Late Intermediate	AD 1100 to AD 1450	Post Tiwanaku, development of local polities
Middle Horizon • Piñami Phase • Illataco Phase	AD 600 to AD 1100	Spread of Tiwanaku material, transition to local production of Tiwanaku style ceramics
Late Formative	AD 200 to AD 600	Development of painted styles in ceramics
Middle Formative	200 BC to AD 200	Monochrome ceramics
Early Formative	1500 BC to 200 BC	Monochrome ceramics

Between 2002 and the completion of this dissertation, there have been other developments of note in Cochabamba. German archaeologist Olga Gabelmann did survey and excavation of a Middle Formative ceramic production site in the High Valley. She found evidence of complementary intra- and inter-western valleys pottery production and long-distance trade networks during the Early and Middle Formative (Gabelmann 2005, 2012a). German archaeologist Christof Döllerer surveyed sections of the Central Valley and excavated at Sierra Mokho (Döllerer 2013). His findings of large-scale public architecture for the Early and Middle Formative from Sierra Mokho add greatly to our understanding of the political complexity of the pre-Tiwanaku Central Valley. I will be referring to the work of both Gabelmann and Döllerer in following chapters.

Chronology at Piñami

Piñami is a multi-component mound that expanded vertically and horizontally over time, making it particularly useful for understanding the chronological development of Piñami. Despite the fact that Piñami was a 3-ha mound reduced to .2 ha (roughly 5% of its original size), what remained gave us evidence of occupational expansion of the mound. Occupation began as early as the Late Middle Formative and continued to the Colonial Period. As pointed out in Chapter 1, multi-component occupation mounds were more common in the Central Valley than elsewhere in the Western Valleys (Gabelmann 2012a:30). They were a common site type in the valley bottom regions, which were characterized by wetland areas and frequent flooding. Those characteristics are conducive to long term sites that grow vertically, creating artificial habitation hills throughout the flood zone.

As to evidence of vertical expansion, fill was added to the site multiple times to make habitation layers level or larger. The fill consisted of looser dirt and clay topped by clay floors or habitation surfaces. Repeated reflooring, patching holes and leveling slowly grew the mound in elevation and in area over time. By the end of the Colonial period, the full vertical extent of the mound from surface to sterile was at least 4.5 meters. Evidence of horizontal expansion is limited, but the site does appear to have spread horizontally over time. As noted in the phase by phase chronology below, the oldest material we excavated (Formative material) was from Sectors B and C. We found no Formative material in Sectors A and A-1; the evidence from those sectors suggests that during the Illataco Phase Sector A-1 was the eastern edge of the mound. It was clear that during the Piñami Phase the mound extended farther east than the limits of A-1 as there were floors and walls that extended eastward.

An abundance of ceramic sherds provided evidence for dating various excavated levels. I analyzed the sherds as to style and associated time periods and used them as the basis for the chronology of Piñami set out below. Of the over 92,000 ceramics excavated, Colonial, Late Intermediate and Middle Horizon occupations each yielded between 20,000 and 30,000 sherds, while Formative sherds were minimal (Table 3.3).

Table 3.3. Piñami Sherd Quantities by Temporal Phase.

Temporal Phase	**Number of Sherds from Temporally Consistent Contexts**
Modern	318
Colonial	26,389
Late Horizon	2,712
Late Intermediate	20,588
Late Middle Horizon transition	7,595
Middle Horizon (Piñami Phase)	22,034
Early Middle Horizon (Illataco Phase)	2,771
Late Formative	348
Middle Formative	46
Excavated contexts with no diagnostic sherds	5,136
Sherds from mixed or disturbed contexts	4,377
Total Sherds	**92,314**

Of the over 92,000 total sherds, a more detailed analysis was done on 21,540 sherds. Results of that analysis as to style, technology and form will be presented in more detail in subsequent chapters.

Phase by Phase Chronology at Piñami

The following chronology of Piñami by temporal phase, starting in the Middle Formative and ending with the Colonial Period, is based on the evidence of the ceramic sherds we excavated.

Middle Formative. Occupation at Piñami may have begun as early as the Middle Formative, but this evidence is equivocal at best. In test pit B-1, which we took to sterile, the lowest 50 cm that had any artifacts yielded only sherds that were Monochrome style, the style characteristic of the Formative. Unfortunately, these sherds were eroded and the matrix around them had a large quantity of sand and gravel mixed in. It was not possible to follow natural layers and all of this material was excavated in 10 cm arbitrary levels. The evidence is not clear enough to tell whether these sherds were part of a Middle Formative occupation at Piñami that was disturbed by flooding or whether these sherds were merely deposited from some other site due to flooding action. At any rate, if there *was* an occupation, it appears minimal compared to those of Quillacollo and Sierra Mokho, both large sites with extensive Middle Formative occupations.

Late Formative. Occupation at Piñami more likely began during the Late Formative, but the evidence is still limited. We were not able to find clear habitation surfaces and had to excavate in 10 cm arbitrary levels. The only Late Formative layers in controlled stratigraphic contexts were found in the 2 by 2 test pit B-1 and at the base of an intrusive tomb near Sector C, and they produced only 143 sherds. Other loci with solely Late Formative ceramics were excavated at the base of features, such as storage pits or tombs, and had limited stratigraphic context. They produced another 205 Late Formative sherds for a total of 348 (Table 3.3). The matrix from test pit B-1 was mostly gravel and silt, suggesting flooding. However, it is notable that these sherds had

Monochrome sherds intermixed with painted Quillacollo style sherds and therefore follow the chronological sequence seen at Quillacollo for Late Formative occupations.

The relatively low quantity of Late Formative sherds can be accounted for by two factors. First, limited areas with possible Formative contexts were excavated. Second, it appears that Piñami was only minimally occupied during the Formative, at least in the section of the mound that was still intact.

Illataco Phase. The Illataco Phase is defined as the beginning of the Middle Horizon and identified primarily by the first presence of Tiwanaku ceramics, an increase in frequency of fineware, and the presence of a dramatically increased variety of local and Tiwanaku style sherds.

We found Illataco Phase material in all sectors. All told, we have 4466 sherds from the Illataco Phase. The depth of the Illataco occupation averaged about 50 cm in thickness. Notably, this Illataco Phase occupation layer is about a fourth of the depth of the Piñami Phase layer and about half of the depth of the Late Intermediate layer. The limited depth of the Illataco Phase at Piñami suggests a relatively short transition period before the more settled Piñami Phase.

Although Illataco Phase material in Sector B was found over Late Formative material, Illataco Phase material in Sectors A and A-1 was found over sterile. The earliest layers in A-1 were on a slant and contained ashes and debris over sterile, suggesting that during the Illataco Phase, A-1 was the eastern edge of the mound.

Three major changes seen in ceramics mark a transition to the Illataco Phase at Piñami. First is the presence of imported Tiwanaku fineware, including both redware and blackware. Second is an increase in the overall frequency of painted ceramics from 2.8%

during the Late Formative to 7.8 % during the Illataco Phase. Third is a dramatic increase in the variety of styles found in the same contexts. In contrast to the Late Formative, which had only two styles, Illataco Phase occupations regularly had up to eight different styles in a single context. These styles included imported Tiwanaku redware and blackware, Late Formative local styles Monochrome, Quillacollo, Tupuraya and Sauces, and a new local style, Cochapampa. In addition, the Illataco Phase manifested the development of a version of the highland Tiwanaku redware style that I have designated Central Valley Cochabamba Tiwanaku or "CVCT" (see Chapter 4 for an in-depth discussion of this style).

Piñami Phase. Pinami Phase material was found in every sector and averaged approximately 2 meters of thickness. The Piñami Phase is characterized by the complete acceptance of the Tiwanaku ceramic style and by local production of CVCT. All other local styles decrease dramatically or disappear (Figure 3.1). Imported Tiwanaku redware and blackware continue but in reduced frequency. The only local styles that are occasionally found are Omereque and Caraparial, which both have centers of production hundreds of kilometers to the east of the Central Valley (Anderson 1997).

Another noteworthy characteristic of the Piñami Phase is the enormous increase in the frequency of painted ware and fineware as a percentage of the overall assemblage. During the Illataco Phase, the painted fineware was 7.8 % of the assemblage and the overall fineware (including sherds that are clearly from fineware vessels but do not have painted designs) was 14.1%. In the Early Piñami Phase, the frequency of painted fineware more than triples to 24.7%, and the number of overall fineware sherds more than doubles to 35.4% of the overall assemblage (Figure 3.2).

The Piñami Phase can be defined by and differentiated from the Illataco Phase by (1) a decrease in the presence of local styles, (2) a decrease in stylistic variety (number of styles per context), (3) an increase in CVCT as a percentage of the painted styles and (4) a dramatic increase in the frequency of fineware overall. These changes in ceramics reinforce Céspedes Paz's division of the Middle Horizon into the Illataco Phase and the Piñami Phase. I believe, however, that a further subdivision of the Piñami Phase is warranted. Though the four characteristics cited above apply to the Piñami Phase as a whole, a closer examination of the evidence shows an important difference between early in the phase and later in the phase. In the first half of the Piñami Phase, fineware accounts for 35.4% of the overall ceramic assemblage; by the second half of the Piñami Phase, fineware drops to 26.2% of the assemblage. It is in part because of this marked change that I propose a subdivision of the Piñami Phase into Early Piñami and Late Piñami, but following chapters will show that burial, architectural and other evidence also support a division into Early Piñami Phase and Late Piñami Phase.

Late Intermediate. Late Intermediate evidence was found in all sectors. In Sector C, the Late Intermediate occupation was roughly .7 meters thick and in A-1 it was almost 1 meter. We have architecture from the Late Intermediate period as well as many large ash and borrow pits from Late Intermediate contexts.

In total we have 20,588 Late Intermediate sherds. The Late Intermediate is characterized by the end of the CVCT style and replacement by a variety of new local, geometric styles. Interestingly, the Late Intermediate was similar to the Illataco Phase in that we find a variety of new styles together in the same contexts. There is a significant

decrease from the Piñami Phase in the frequency of painted ware (12%) and fineware (11%). (Ceramic analysis will be discussed in detail in Chapter 4 and 5).

Late Horizon. It is the presence of Inca ware or Inca influenced ware that distinguishes the Late Horizon, and we did find both imported and local versions of some Inca ware. It was hard to distinguish the Late Horizon occupation, however, since most of the local styles continue from the Late Intermediate and we found only a limited number of imported Inca and Inca influenced sherds. Thus, it was difficult to estimate the depth of the Late Horizon occupation, but I would estimate it to be less than .5 meters. What I found most noteworthy about the Late Horizon is that the Inca presence did not change the local fineware styles in the way that Tiwanaku presence did. The impact of the Inca on the Late Intermediate ceramic styles already in use was comparatively light.

Colonial. We found Colonial ceramics but no direct evidence of Colonial architecture. In Sector C, we did find a large refuse pit with an enormous quantity of ceramic roof tiles (*tejas*) mixed in the pit fill. Although there were not many undisturbed habitation layers associated with the Colonial occupations, the large pits from the Colonial Period resulted in over 26,000 sherds from associated loci and features.

New Radiocarbon Dates and Absolute Chronology

The absolute chronology of Tiwanaku expansion to Cochabamba is of key importance in characterizing the timing of state development and expansion. The chronology of the Central Valley traditionally has been based on very few radiocarbon dates. Therefore, the addition of four radiocarbon dates from Piñami is substantial (Anderson 2012).[3] The new dates not only help refine Central Valley chronology but also help set Tiwanaku expansion to Cochabamba within the larger regional expansion. Based on radiocarbon dates from Piñami, supported by the single radiocarbon date from Quillacollo, I will argue that the start of the Middle Horizon in Cochabamba was later than previously thought. I will also argue that the four new dates suggest that Tiwanaku expansion to Cochabamba was similar in timing to Tiwanaku expansion to other peripheries.

Prior to these new Piñami dates, the beginning of the Middle Horizon in the Central Valley was based on ceramic comparisons with the highland sequence as well as on two radiocarbon dates from a Central Valley site, Sierra Mokho, excavated by Donald Brockington and his team. The dates had calibrated intercepts of AD 660 and AD 690 (Brockington et al. 1985). (See Table 3.4 and Figure 3.3.) Based on these dates, Brockington set the start of the Middle Horizon at AD 600. However, the excavation used 20 cm arbitrary levels and the dates had very large error ranges, giving a one sigma calibrated range of 240 and 340 years and a two sigma interrupted calibrated range of 460 and 770 years (Table 3.4 and Figure 3.3).

In contrast, Ricardo Céspedes Paz suggested that the Middle Horizon in Bolivia began in AD 350, much earlier than the AD 600 date. He based this early start date on one unpublished radiocarbon date from a Central Valley excavation (Ricardo Céspedes

Paz, personal communication 1993). Céspedes Paz dated the Illataco Phase from AD 350 to AD 725 and the Piñami Phase from AD 725 to AD 1100 (Céspedes Paz 2000).

A further attempt to confirm the date for the beginning of the Middle Horizon was based on a single carbon sample from Quillacollo (Céspedes Paz et al. 1994). With the financial support of Bill Isbell and permission of Ricardo Céspedes, I prepared and sent the sample to Beta Analytic Inc. for accelerator mass spectrometry (AMS) dating and calibration. The AMS technique was chosen due to its higher precision and reduced error ranges. The sample was from charcoal found in the earliest natural layer that contained Tiwanaku material. This sample produced a surprisingly late calibrated intercept date for the beginning of the Middle Horizon of AD 890 +/-30 with a one sigma interrupted calibrated range of AD 810 to 900 and AD 920 to 940 and a two sigma calibrated range of AD 770 to 980, setting the beginning of the Middle Horizon closer to AD 800 or 900 than to AD 600 and even farther from the earlier date of AD 350 proposed by Céspedes Paz.

The Piñami Project sought to address the discrepancy as to the beginning of the Middle Horizon and to establish dates for critical junctures during the Middle Horizon. I submitted samples for radiocarbon analysis to Beta Analytic for accelerator mass spectrometry (AMS) dating and calibration. (See Appendix 1 for the complete Beta Analytic report for Piñami.) Table 3.4 and Figure 3.3 set out Central Valley radiocarbon dates, two from Sierra Mokho (taken from Brockington et al. 1985, with recalibration done by Beta Analytic), one from Quillacollo (taken from Céspedes Paz et al. 1994, analysis done by Beta Analytic) and four new dates from Piñami.

Table 3.4. Radiocarbon Dates from Central Valley Sites

Lab #	ID	Excava-tion method	Type	Phase	Radio carbon age range	Calibrated results		
						Inter-cept	Range (1 SD)	Range (2 SD)
Sierra Mokho								
GX-12136	SM P0 N9-13	20 cm levels	Animal bone	Middle Horizon	AD 590 +/- 190	660	AD 540-880	AD 260-290 and 320-1030
GX-10760	SM P1 N7-8	20 cm levels	Animal bone	Middle Horizon	AD 670 +/- 120	AD 690	AD 650-890	550-1010
Quillacollo								
Beta-68750	Q2 N5b	Strati graphic	Charred material	Illataco	1160 +/- 40 BP	AD 890	AD 810-900 and 920-950	AD 770-980
Piñami								
Beta 318299	Q1-B L2063	Strati graphic	Charred material	Illataco	1210 +/- 30 BP	AD 789, 790, 800	AD 770-880	AD 710-750 and 770-890
Beta 318297	Q1-B L2061	Strati graphic	Charred material	Illataco	1140 +/- 30 BP	AD 890	AD 880-900 and 920-940	AD 780–790 and 800-970
Beta 318296	Q1-A1 L2035	Strati graphic	Charred material	Early Piñami	1120 +/- 30 BP	AD 890	AD 880-900 and 920-970	AD 780–790; 810–850 and 950-980
Beta 318295	Q1-A1 L2010	Strati graphic	Charred material	Late Piñami	940+/- 30 BP	AD 1030	AD 1020-1050; 1090-1120; 1140-1150	AD 1020-1160

The Piñami dates are all from stratigrafically controlled excavation layers and the samples were all carbon. Contexts for Piñami radiocarbon samples:

- Locus B-2063: Sample was taken from the earliest strata that had carbon adequate for dating. Context was a habitation surface from early in the Illataco Phase.

- Locus B-2061: Sample was carbon taken from a habitation surface from the late Illataco Phase.
- Locus A1-2035: Sample was carbon taken from the early in the Piñami Phase. Context was fill between habitation layers.
- Locus A1-2010: Sample was charred material taken from a habitation surface midway in the Late Piñami Phase.

Illataco Phase

We have two samples from Piñami for the Illataco Phase. The earlier date comes from a sample of carbon from Locus B-2063. The sample was taken from the earliest layer of the Illataco Phase that contained material adequate for dating and was located very close to the earliest strata with Tiwanaku style material. The sample produced calibrated intercept dates of AD 789, 790 and 800 with a one sigma calibrated range of AD 770 to AD 880 and an interrupted two sigma calibrated range of AD 710 to AD 750 and AD 770 to AD 890. This date range corresponds with Late Tiwanaku IV through Early Tiwanaku V in the highland sequence (Table 3.1) and is similar to that of the beginning of the Chen Chen occupation at Moquegua.

The later Illataco Phase date is from B-2061. The sample, taken from carbon, produced a calibrated intercept date of AD 890 with an interrupted one sigma range of AD 880 to AD 900 and AD 920 to AD 940 and an interrupted two sigma calibrated range of AD 780 to AD 790 and AD 800 to AD 970. This date range corresponds with Late Tiwanaku IV through Early Tiwanaku V in the highland sequence (Table 3.1).

Piñami Phase

Piñami produced two dates from the Piñami Phase, one notably earlier than the other. The earlier Piñami Phase sample, from A1-2035, was found in fill between habitation layers from the beginning of the Piñami Phase. This sample produced a date almost identical to that of the Illataco Phase sample from B-2061, but the ceramic evidence clearly identified a Piñami Phase context. The A1-2035 sample produced a calibrated intercept of AD 890 and an interrupted one sigma range of AD 880 to AD 900 and AD 920 to AD 970 and an interrupted two sigma range of AD 780 to AD 790, AD 810 to AD 850 and AD 950 to AD 980.

Sample A1-2010 was taken from much later in the Piñami Phase. The context was a habitation floor composed of clay mixed with carbon and burned clay bits. The calibrated intercept date is AD 1030 with an interrupted one sigma range of AD 1020 to AD1050, AD 1090 to AD 1120 and AD 1140 to AD 1150 and a two sigma range of AD 1020 to AD 1160. This date is later than expected but still more or less consistent with the AD 1100 end date for the Middle Horizon at Tiwanaku.

Discussion

The 92,000 ceramic sherds gave us a tremendous data point. I have used the evidence from those sherds to help form the chronology of Piñami outlined above. First, the ceramic findings reaffirmed Céspedes Paz's division of the Middle Horizon into the

Illataco and Piñami Phases. Second, the evidence makes a strong case for the subdivision of the Piñami Phase into Early Piñami and Late Piñami. Subsequent chapters will further support that case based on ceramics, burial and architectural findings.

Another important contribution of the excavations was the addition of four new radiocarbon dates. Two aspects of those dates are especially noteworthy. First, the new Piñami dates are noteworthy for their implications for Middle Horizon chronology. As noted, Céspedes Paz proposed a start date for the Middle Horizon in the Central Valley of AD 350 and Brockington proposed AD 600. The Quillacollo sample (two sigma range of AD 770 to AD 980) suggests an even later start date. The Piñami evidence addresses this discrepancy. The two Illataco Phase dates, like the Quillacollo date, support a late start for the Middle Horizon. Neither of the Illataco Phase dates is prior to AD 700. Indeed, based on the Piñami findings, the earliest possible start date for the Middle Horizon at the *two sigma* calibrated range is AD 710. Though more dates are necessary for a firm chronology, the Piñami evidence, combined with the Quillacollo finding, suggest a date of at least AD 700 for the beginning of the Middle Horizon in the Central Valley flatlands.[4]

Second, a key question for Cochabamba chronology is whether Tiwanaku expansion to Cochabamba is part of a larger southern Titicaca pattern. The four new radiocarbon dates from Piñami, combined with the Quillacollo date, are similar to dates found in the Tiwanaku periphery of Moquegua. (See Goldstein 2005:128-131 for detail of Moquegua radiocarbon dates.) As mentioned earlier, Goldstein notes that the Middle Horizon Chen Chen occupation at Moquegua has a one sigma range of AD 785 to AD 1000 (Goldstein 2005:158). A one sigma range for the Middle Horizon Piñami dates is

AD 770 to AD 1090. The strong similarity of dates between the Central Valley and another periphery is a finding consistent with the idea of a larger southern Titicaca pattern of expansion.

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Conclusion

In this chapter, I have introduced some of my findings at Piñami and their implications for a Western Cochabamba Valley Chronology. I have laid out a chronology of Piñami based largely on ceramic findings and have presented four new radiocarbon dates from Piñami to help refine a chronology that previously had few such dates. I will, throughout the course of this dissertation, further support my argument for a subdivision of the Piñami Phase based on the ceramic, mortuary, architecture and other evidence of this rich site.

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[1] This definition of the Middle Horizon does not suggest that there was no earlier contact between Tiwanaku and Cochabamba. Even before the Middle Horizon, Cochabamba had been part of long-distance trade routes to the highlands and beyond (Céspedes Paz, et al. 1994; Céspedes Paz 2000; Döllerer 2013; Gabelmann 2008, 2012a).

[2] Tiwanaku I, II and III actually predate the Tiwanaku state. The designations of Tiwanaku I, II, III, IV and V were developed by Ponce Sanginés (1981) and indicate phases of cultural change at the site of Tiwanaku from its earliest occupations. To make the chronology of the Tiwanaku state clearer, Janusek has suggested that Tiwanaku IV be changed to Tiwanaku 1, when Tiwanaku developed into a state level society and the preeminent site in the region, and that Tiwanaku V be designated Tiwanaku 2 (Janusek 2008). For this dissertation I will use the designations Tiwanaku IV and Tiwanaku V as they are still in common use.

[3] I sent five samples for radiocarbon testing, but I later judged the context of one of them to be insecure. All five dates are listed in the Beta Analytic report (Appendix 1).

[4] Just as Goldstein found the earliest dates in Moquegua in the higher elevation sites along caravan routes (Goldstein 2005), it is possible that there were similarly earlier Middle Horizon occupations in the Western Valleys along caravan routes. Such earlier occupations might result in a variance of dates for the beginning of the Middle Horizon in Cochabamba as marked by the presence of Tiwanaku material. Even so, the consistency of the later dates for the beginning of the Middle Horizon in the Central Valley *flatlands* indicate to me a post AD 700 beginning.

Table List for Chapter 3

Figure List for Chapter 3

Chapter 4: The Distinctive Features of the Central Valley Cochabamba Tiwanaku Style[1]

In 1934, Wendell Bennett published "Excavations at Tiwanaku" in which he presented his now famous definitions of the Classic and Decadent ceramic styles of the Tiwanaku state (Bennett 1934). After excavating in the High Valley of Cochabamba, Bennett concluded that the influence of Tiwanaku on Cochabamba ceramics was clear, but differences between the styles led him to coin the term "Derived Tiahuanaco" to refer to "the relationship of the best Cochabamba material to the Classic Highland type" (Bennett 1936:402). Subsequent research, however, including my own as it will be presented in this chapter, leads to a refining of the question of how "derived" the Cochabamba style actually is and how it compares to the styles of the highlands and other peripheries.

A number of scholars have expounded on differences between the highland style and the Cochabamba version of it. Ibarra Grasso (1973 preferred the term "Expansive Tiahuanaco" to denote that the Tiwanaku style found its way to Cochabamba during the "Expansive" phase of Tiwanaku political development. He agreed with Bennett that it was similar to the Classic style with "some differences: there are fewer [vessel] forms and motifs and instead we find distinct forms and some new geometric motifs" (Ibarra Grasso 1973:206, translation by author).

Significantly, "Derived Tiwanaku" and other eastern styles have been found as imports at Tiwanaku itself (Rivera Casanovas 1994:186). In excavations at Ch'iji Jawira,

on the outskirts of the Tiwanaku urban area, Rivera also noted in the iconography a combination of the Tiwanaku style and a local Cochabamba style (Rivera Casanovas 1994:187). Janusek, in his extensive studies of the Tiwanaku style and its variations (Janusek 1994, 2002, 2003b), considered the differences between highland Tiwanaku and Cochabamba styles, noting that: "This was an expansive style in the sense that the stylistic complex clearly emerged as a result of the incorporation and synthesis of nonlocal with Tiwanaku iconography and ideology" (Janusek 2003b:75).

Thus, since its early description as Derived Tiwanaku, the "Cochabamba Tiwanaku" style has generally been seen as distinct enough from highland Tiwanaku to be easily identifiable as a deviation from the true Tiwanaku style. The perceived stylistic variation has been used to support the argument that the Cochabamba region was more politically independent of Tiwanaku than other peripheries. However, detailed analysis of the "derived" Cochabamba style has been lacking. In pursuing this issue, Bennett faced what likely seemed to him a straightforward question: does the Cochabamba material reflect Classic Tiwanaku, Decadent Tiwanaku, or neither? The question itself has turned out to be misleading, as later research showed that the Tiwanaku style was not uniform even in the heartland. Instead of a consistent Classic style throughout the core, there is discernible variation between sub-regions, sites, and even within the neighborhoods of the Tiwanaku capital in preferred motifs, forms, slip colors, pastes, paints, technical virtuosity, etc. (Alconini Mujica 1993; Bermann 1990, 1994; Burkholder 1997; Couture 2002; Janusek 2002, 2003b; Rivera Casanovas 1994, 2003). Key Tiwanaku peripheries likewise show preferences for certain form variations and motifs. For example, in the Katari Basin to the east of Tiwanaku, the local Tiwanaku style

included a distinctive tanware (Bermann 1994; Janusek 2003b), and in the Moquegua Valley to the west of Tiwanaku, Goldstein identified two distinct and contemporaneous Tiwanaku styles, Omo and Chen Chen (Goldstein 2005).

At Tiwanaku, though there is an overarching Tiwanaku style, local production was the norm and local social identity was expressed via slight variations in iconography, vessel form, color, etc. (Janusek 2002, 2003b). Our question, then, is not whether Cochabamba Tiwanaku ceramics from Piñami match a *single* "Tiwanaku" style, but whether the variation at Piñami fits into the typical *range of variability* found within the Tiwanaku core or whether the Central Valley Cochabamba Tiwanaku style is truly distinct.

My own position on how the Cochabamba style compares to Tiwanaku and other highland and peripheral styles grows out of my research at Piñami.[2] In order to evaluate whether the Tiwanaku style found at Piñami fits within the larger Tiwanaku style, I feel that not only is it important to evaluate differences, but it is also critical to establish a measure of the degree of *similarity*. In addition, I argue that comparing a variety of attributes of the style provides a robust method for assessing the similarities and differences between the Tiwanaku material of Cochabamba and that of the highlands. I will examine vessel-centered aspects of the style such as iconography, vessel form and production techniques as well as changing use patterns, including frequency and context. Overall, my conclusion is that the Tiwanaku style found in the Central Valley is a *highly* Tiwanaku style that fits into the range of variation found in the highlands.

I have designated the locally produced Tiwanaku material found at Central Valley sites the "Central Valley Cochabamba Tiwanaku" style (CVCT). The aspects of style

that I will be examining can be subdivided into those that are more obvious, such as major motif, color, form and shine, and those that are more subtle, such as symmetries and framing lines as well as less visible aspects of the production process. Obvious aspects of style are those that are easier to copy by simply seeing a vessel, even from a distance, whereas subtle aspects tend to indicate close examination of foreign vessels or contact with the potters who make them; adoption of the least visible aspects of a style suggests training by potters conversant in the style (Bowser 2002; Gosselain 1992, 1998; Rice 1987; Stark 1998; Washburn 1977).

In order to assess the degree of Tiwanaku influence, it is important to examine not only vessel-centered stylistic aspects but also use patterns. That is, are the frequency of fineware and the contexts of use reflective of Tiwanaku patterns or are they simply extensions of pre-existing local Cochabamba traditions for fineware?

The evidence will show that the CVCT was a highly Tiwanaku style in both overt and subtle characteristics and that the context and frequency patterns are a noteworthy change from Late Formative patterns. Overall, this evidence points to a high degree of Tiwanaku influence and willing adoption of Tiwanaku traits.

Tiwanaku and Regional Styles

My characterization of CVCT in this chapter will cover four major variables—form, iconography, technology and use practices—and will also compare these aspects of the CVCT style to patterns in the highland Tiwanaku styles and Cochabamba regional styles.

While most of the terms used to describe ceramic styles, such as burnishing, slip color or motif, are generally understood, the terms for ceramic symmetry patterns are less familiar. Since I compare symmetry patterns throughout this discussion, I will begin by defining some of the key terms using concepts and vocabulary developed by Washburn (1977). These include four terms to describe how motifs are repeated on a vessel: translation, reflection, reflection with slide and rotation. In addition, Washburn notes the importance in characterizing style according to whether rotated motifs are side-by-side or interlocking and uses the term counterchange to describe whether the color pattern changes as the motif is repeated. The key terms and definitions I use are set out below and illustrated in Figure 4.1:

- **Translation**: The main motif is repeated along a line axis.
- **Reflection:** The fundamental parts of the design are reflected across a line axis, producing a mirror image.
- **Slide Reflection**: The motif is reflected across a line and then translated along the same axis.
- **Rotation**: The fundamental parts of the design rotate around a point.
- **Interlocking:** Designs are rotated in such a way that they are made to fit together.

- **Counterchange:** Color is alternated between repeated motifs. Counterchange most often alternates between two colors, but some styles use three or more.

Regional Cochabamba Styles

In order to be able to tell whether the CVCT style combines local and Tiwanaku traits, it is necessary to review briefly the local styles, whether precursors to the period of Tiwanaku contact or contemporaneous with it. The seven regional Cochabamba styles I will present here were all found in the Central Valley during the Middle Horizon. Four of these, Quillacollo, Tupuraya, Sauces and Mojocoya, were Late Formative styles that continued into the Illataco Phase. Two of the remaining styles, Omereque and Caraparial, possibly developed in the Late Formative but did not reach the Western Valleys until the Middle Horizon. The last style, Cochapampa, is new to the Middle Horizon.

Quillacollo Style. I participated in the 1993 excavation that first recognized the Quillacollo style (Céspedes Paz et al. 1994). To date, this style has been found in only a few sites in the Central Valley and the greater Cochabamba region, but the most concentrated find was at the type-site of Quillacollo (Anderson and Céspedes Paz 1998; Céspedes Paz et al. 1994). It is present at Piñami, and reportedly similar material was found by Brockington in the Eastern Valleys area (Donald Brockington, personal communication 1994).

The most common painted form for Quillacollo ware is a shallow, round bowl (Figure 4.2). Simple painted decorations are applied on the interior of the bowls using reddish-brown or purple paint applied over a cream-to-orange wash or thin slip. The primary motifs are vertical stripes, cross-hatching and wavy lines. The most typical symmetry type is translation along a horizontal axis.

Tupuraya and Mojocoya Styles. Tupuraya and Mojocoya are common Late Formative styles with Tupuraya found in the Western and Eastern Valleys (Döllerer 2004) and Mojocoya more common in the Eastern and Far Valleys (Pereira and Brockington 2005). Both styles are characterized by black and red paint using similar geometric iconography (Figure 4.3). Step volute designs are common in both, and each frequently uses rotational interlocking design symmetry with two-color counterchange. In both, the primary designs are on the exterior of the vessels. The Tupuraya style can be distinguished from Mojocoya by its white-ish base slip applied over the entire vessel and by its primarily rectilinear designs. In addition to the step volute design, Tupuraya uses boxes and comb motifs. The Mojocoya style typically has an orange-to-tan base slip, and the interlocking black and red designs are more often curvilinear.

Sauces Style. The Sauces style is found in the Eastern and Far Valleys and in the northern Department of Chuquisaca, possibly starting in the Late Formative (Ibarra Grasso and Querejazu 1986) but arriving in the Central Valley at the beginning of the Middle Horizon (Céspedes Paz 2000). Sauces is characterized by black painted designs with a cream-colored outline, usually over a red or orange-ish slip or wash (Figure 4.4). The key motifs include flags, rows of triangles, steps and the half cross. The main motifs are usually filled in with black paint and at times cream-colored dots are applied over

them. Sauces motifs tend to be repeated using horizontal translation symmetry. Sauces painted designs are much simpler and bolder in outline than those of Tupuraya and Mojocoya and the brush strokes produce thicker lines. Interestingly, Sauces style vessels are frequently found as burial offerings alongside Tiwanaku vessels through the Early Piñami Phase at Piñami, whereas Quillacollo and Tupuraya style vessels are not present. (See Chapter 6 for more detail).

Caraparial and Omereque Styles. These two styles are from the Far Valleys region, especially along the Rio Mizque drainage and into northern Chuquisaca (Anderson 1997; Anderson and Céspedes Paz 1998; Bennett 1936: 387-388; Ibarra Grasso and Querejazu 1986:214-215; Janusek 2003b:81). They are notable in that, unlike the styles discussed above, they persisted throughout most of the Middle Horizon. Only limited examples are found in the Western Valleys (Byrne de Caballero 1984; Céspedes Paz 2000; Céspedes Paz et al. 1994; Higueras Hare 1996). At Piñami, only a few Omereque vessels were present as grave offerings and Omereque fragments were very rare in domestic contexts throughout the Middle Horizon. While the Omereque and Caraparial styles can easily be distinguished from one another, they are clearly related as they occur in the same contexts and can be found painted in different sections of a single vessel (Anderson 1997).

The Caraparial style is similar to Tupuraya and Mojocoya and is a precursor of the Late Intermediate Period Yampara style (Ibarra Grasso 1973) (Figure 4.5). Interlocking step volute designs, rotational symmetry and translation are common. The style has a wider palette than the styles discussed above, including black, white, purple, orange, red, and gray. The vessels most frequently use two-color counterchange between

black and another color or use two design colors with black as a background. It is characteristic of the Caraparial style that areas of black, whether background or interlocking motif, are of a similar width to the major designs and that designs have thin white outlines.

The Omereque style, also referred to as Nazcoide (Ibarra Grasso 1973), is the only Cochabamba style that routinely uses anthrozoomorphic motifs. It is a highly polychrome style (Figure 4.6), usually having six or more colors per vessel. The vessels typically have an orange base with motifs painted in three or more colors (out of purple, red, orange, ochre or gray). Motifs are outlined first in black and then white. Omereque anthrozoomorphic figures are highly stylized and, like Caraparial, the designs tend to be portrayed such that all figural elements are a consistent width.

One of the most diagnostic elements of the Omereque style is its unique color symmetry, which uses three-color counterchange. While the Omereque symmetry pattern for repeated designs is usually simple translation or rotation, the paint colors used are not typically repeated exactly but instead alternate between repetitions. For example, the vessel in Figure 4.7 uses purple, orange and gray for motifs, but colors alternate between repetitions so that the head of the figure is gray in one repetition and purple in the next, etc. This three-color counterchange is also used on one of the diagnostic bands common to the Omereque and Caraparial styles.

Cochapampa Style. The Cochapampa style is still poorly defined and is considered to be a Tiwanaku/local hybrid (Céspedes Paz 2000).[3] This style is found particularly in the Western Valleys (Céspedes Paz 2000; Döllerer 2004), and in Central Valley excavations it first appears in the Middle Horizon during the Illataco Phase.

Cochapampa vessels have black paint applied over a tan-to-orange paste that is smoothed or roughly burnished (Figure 4.8). The iconography is almost entirely geometric, employing Tiwanaku motifs such as chevrons and triangles with diagonal lines as well as non-Tiwanaku motifs such as comb patterns, concentric squares and rectangles with crosses. The primary designs are on the exterior of closed forms but, unlike Tiwanaku and similar to Sauces, they are on the interior of open forms such as *tazones*. *Keros* are more common in the Cochapampa style than they are in any of the styles mentioned above. Cochapampa *keros* are less flaring and the design application is less symmetrical than is typical for the Tiwanaku and CVCT styles.

Overall, at the time of early Tiwanaku interaction, the regional styles, aside from Omereque, used geometric iconography with primarily one or two paint colors. Interlocking designs with counterchange were common in Tupuraya, Mojocoya and Caraparial.

Tiwanaku Style

The Tiwanaku style has been well-documented and described by various researchers, notably Alconini Mujíca (1993), Bennett (1934, 1936), Burkholder (1997), Goldstein (1985, 1989, 2005), Janusek (2002, 2003b), Rivera Casanovas (1994), Rydén (1959), Vetters (1995) and Wallace (1957). For the purposes of this paper, I will highlight aspects of the Tiwanaku state style that facilitate my comparisons: forms, iconography, technology and use.

The Tiwanaku style developed rather suddenly around A.D. 500 (Janusek 2003b:56). Although it had Late Formative precursors, the new style was quite distinct and, once developed, it remained in use throughout the duration of the Tiwanaku state, until ~AD 1100. Among the most notable aspects of this new style are its deep red slip and a distinctive iconography composed of both geometric and naturalistic motifs, including humans, felines, camelids, birds, fish and snakes, applied to a new and varied assemblage of vessel forms. The most common serving ware forms are the *kero* drinking vessel and the *tazón* flaring bowl. The style includes a wide range of other vessel shapes, including various small jars (*vasijas*), pitchers (*jarras*) and ceremonial vessels such as incense burners and effigy vessels (Janusek 2003b).

New production technologies were introduced at the advent of the Tiwanaku period as well. Tiwanaku style vessels are well-burnished, with some vessels highly burnished. Tiwanaku firing techniques result in hard vessels that are either oxidized, partially oxidized with a reduced core or fully reduced (Janusek 2003b:82). Pastes could be without temper but typically contained fine sand and occasionally mica or limestone (Janusek 2003b:80; Rivera Casanovas 1994:166-167).

At both Piñami and Quillacollo, there was a substantial percentage of imported Tiwanaku ceramics beginning in the Illataco Phase, comprising approximately 3 to 5 percent of the assemblage or 25 to 35 percent of the *decorated* sherds. Imported Tiwanaku material was identified based on some of the distinguishing characteristics discussed below, though key among them were diagnostic pastes, temper, and slip and paint colors (Figure 4.9). Interestingly, the imported Tiwanaku ware found in the Central Valley included some of Tiwanaku's most well-known sub-styles. One notable sub-style

is Tiwanaku blackware (Figure 4.10), which uses many of the same forms as redware but is reduction-fired and smudged, producing a glossy black finish. Blackware is found throughout the Tiwanaku sphere but appears to have been more popular in the southwestern Titicaca Basin, including Copacabana and the Island of the Sun. Blackware was also a major component of the Omo style, one of the two co-existing Tiwanaku styles found in Tiwanaku's western periphery Moquegua (Goldstein 2005:198). Other notable sub-styles found in the Central Valley are vessels that correspond to those typical of the Katari Valley, located to the northeast of the Tiwanaku Valley. Katari Tiwanaku material has the majority of the typical Tiwanaku forms and motifs but is distinguished by tanwares in addition to redwares, by the preference for some motifs such as continuous volutes, by some *tazones* that are slipped red on the interior and only show a red band on the upper exterior, and by ritual vessels such as effigy *incensarios* (Bermann 1990; Janusek 2003b). Imported examples of these Katari variations were found at Piñami and Quillacollo excavations (Figures 4.11 and 4.12). Thus, during the transitional Illataco Phase, the Central Valley was exposed to not only a variety of Cochabamba regional styles but also ceramics from throughout the Tiwanaku heartland and peripheries.

The CVCT Style – Forms, Iconography, Technology and Use

Before discussing the CVCT style in detail, it is important to briefly review the chronological and social context for the genesis of the style. The stratigraphic evidence from Piñami and Quillacollo shows that the CVCT style began early in the Illataco Phase, appearing alongside Cochapampa, imported Tiwanaku and other regional styles. Considering the number of styles available, the frequency of CVCT was relatively high, comprising approximately 25 percent of the Illataco Phase serving ware. Notably, by the Piñami Phase, the CVCT style had become the dominant decorated style, comprising approximately 85 percent of the serving ware; all other styles were reduced or absent.

In the following analysis of the CVCT style, I emphasize the ways in which it is resembles and differs from the Tiwanaku style and other Cochabamba styles in terms of vessel forms, iconography, technology and use patterns.

CVCT Vessel Forms

The assemblage of forms used in the CVCT style is generally the same as in the highlands at sites outside the ceremonial core, although there are some clear Cochabamba adaptations. For the CVCT assemblage, the most common forms are tall flaring flagons (*keros* and *vasos embudos*) and shorter flaring bowls (*tazones*).

Keros. *Keros* were present in Cochabamba from the Early Formative but were rare in household contexts. Formative Cochabamba *keros* vary in shape but are generally more cylindrical than flaring and sometimes have handles. CVCT *keros* were one of the most common forms in domestic and mortuary contexts throughout the Middle Horizon. Interestingly, despite the presence of *keros* in Cochabamba prior to Tiwanaku (Anderson

2009; Céspedes Paz 2000; Pereira Herrera et al. 2001), the CVCT *kero* adopted the flaring outline and raised bands common in the Tiwanaku style.

As at Tiwanaku, CVCT *keros* come in a variety of sizes including mini *keros*, small *keros* and the standard *keros* typical in Tiwanaku (Janusek 2003b:60). However, we find two size clusters at Piñami: one that is similar in shape and size to typical Tiwanaku *keros*, averaging 16.2 cm in height with an average rim diameter of 14.3 cm, and a significantly taller *kero*, averaging 21 cm in height with a narrower waist and a flaring rim averaging 16 cm in diameter (Figure 4.13). These taller, narrower and more flaring *keros* are one of the forms that distinguish CVCT ceramics.

Vasos Embudos. The *vaso embudo* or funnel cup is the only CVCT form that was not common in the Tiwanaku assemblage. Instead, the form is characteristic of the Far Valleys styles Mojocoya, Omereque and Caraparial, possibly starting in the Late Formative (Pereira Herrera and Brockington 2005). The diameter of the rim of the *vaso embudo* is similar to that of a *kero* (average. 13.6 cm), but the base is so small that the vessel cannot stand up on its own. The CVCT version of the *vaso embudo* applies Tiwanaku iconography and banding to this local form (Figure 4.14).

An early variant of the CVCT *kero* has an angular, constricted waist surmounted by a straight flaring upper body, perhaps representing a synthesis of the *vaso embudo* and the *kero* (Figure 4.15). This type of *kero* was only found in the Illataco and Early Piñami phases.

Tazones. Despite a variety of bowl forms present among the Cochabamba regional styles, the most common bowl form in CVCT is the flaring bowl, the *tazón*, also the most common bowl form of the Tiwanaku style (Janusek 2003b:63). While similar in

overall shape to the Tiwanaku *tazón*, CVCT *tazones* tend to be smaller, with rim diameters averaging 12.6 cm as compared to the 14.5 cm average diameter reported for Tiwanaku *tazones* (Janusek 2003b:63) (Figure 4.16).

Other forms. Tiwanaku style *jarras*, *vasijas* and wide-mouth jars are present in the CVCT style, though in limited quantities (Figure 4.17). The majority of specialized Tiwanaku ritual vessels, such as *incensarios* or effigy vessels, in contrast, appear to be imported and these vessel forms did not become a consistent part of the CVCT style.

CVCT Iconography

Motifs. The iconography of the CVCT style strongly follows Tiwanaku canons and includes the majority of the basic motifs found at Tiwanaku, including:

- geometric motifs—squares, diamonds, and stepped elements, volutes, spirals, concentric circles, straight and wavy lines, and "interlocking fret" designs (Figure 4.18).
- anthropomorphic figures—realistic human figures; stylized (mainly human) heads seen both in profile and as rhomboidal front-face images (Figure 4.19).
- zoomorphic figures—lake birds, raptors, flocks of birds, felines (both heads and full body), camelids, and fish (Figure 4.20).
- mixed zoomorphic figures—figures composed of parts of multiple animals (bird wing on feline body, etc.) (Figure 4.20).

An examination of the major motifs found on whole Tiwanaku style vessels from Piñami burials (Table 4.1) shows that the most common motifs are essentially the same as the most common ones at Tiwanaku. For example, two of the most common figural motifs from Piñami are the profile human head and the profile feline head, and among the most common geometric motifs at Piñami are wavy vertical lines, steps and diagonal lines, volutes and scroll designs; all of these are reported to be among the most common motifs at Tiwanaku as well (Janusek 2003b:64-65).

Table 4.1. Frequency of Central Motifs Found on Whole Tiwanaku Vessels from Burial Contexts at Piñami.

		Kero	Challador	Tazón	Vasija	Jarra	TOTALS
FIGURAL	**MOTIFS**						
Human	Profile head	7				1	8
	Triangle head	3					3
	Step head	1				2	3
	Front face human full body with arms up		1				1
	Realistic full body in profile	1					1
	Frontal view of head only				1		1
	Skull in profile	1					1
Feline	Profile feline head	2	2				4
	Feline head with "wing" behind head	3					3
	Feline head on bird body or with bird wing	1	1				2
Bird	Long leg, long neck bird	2			1	1	4
	Raptor profile head and body				2		2
	raptor profile head on geo design	2					2
	Double bird tail					1	1
Fish	Fish head on bird body				1		1
Snake	Snake body as band			2			2
	Snake profile head and body w/ wing and legs	1					1
Camelid	Camelid profile head and body						0
	TOTAL FIGURAL MOTIFS	**24**	**4**	**2**	**5**	**5**	**40**
GEOMETRIC MOTIFS							
	Step and diagonal line	1	3	4	3	2	13
	S design (8), inverted S (4)			12			12
	Wavy vertical lines	1	1	8	1		11
	Continuous round volute	3		2	2	2	9
	Half cross and back to back "E" designs			3		1	4
	"Flock of birds"			1	2		3
	Square interlocking fret			3			3
	Cross and 4 triangles	2	1				3
	Black squares			2	1		3
	Diamond surrounded by 4 steps	2					2
	Step and volute (step fret)	2					2
	Odd designs (mixes)	1		1			2
	Black and white chevrons	1	1				2
	Other designs	2	2			2	6
	TOTAL GEOMETRIC MOTIFS	**15**	**8**	**36**	**9**	**7**	**75**
	TOTALS QUANTITY OF VESSELS	**39**	**12**	**38**	**14**	**12**	**115**

Examination of motif by vessel form shows additional similarities between highland Tiwanaku and CVCT. For example, Janusek notes that highland *tazones* almost

exclusively use geometric designs (Janusek 2003b:64). At Piñami, of 38 whole *tazones*, 36 (95 percent) have geometric iconography (Figure 4.21). *Keros* at Tiwanaku portray more figural imagery, especially during Tiwanaku IV (Janusek 2003b:61-62). At Piñami, 62 percent of the whole *keros* (primarily from early Middle Horizon burials) use anthrozoomorphic iconography.

A number of researchers have pointed out particular motifs they consider to be diagnostic of vessels from Cochabamba (Burkholder 1997; Janusek 2003b:75; Rivera Casanovas 2003). These include the inverted scroll (a backwards "S" which is a variant on the regular Tiwanaku scroll "S" motif); a star/eclipse design often found as part of a snake band; a J design; and a variety of cross motifs, including dotted, Andean and pendant half-cross varieties (Figure 4.22). Variants of the cross design and the snake band are commonly used in CVCT, though cross-design variants also appear to be present in some parts of the highlands (see Burkholder 1997:188, Figure 8.9) and may not be characteristic of Cochabamba. Other supposedly "Cochabamba" motifs are not characteristic of the CVCT style, though they may be more prevalent in the Eastern and Far Valleys. For example, scroll designs are common in CVCT, as at Tiwanaku (Janusek 2003b), but the majority found at Piñami are normal Tiwanaku scrolls, not the reversed "Cochabamba" scroll.

Colors. The CVCT style uses the typical complement of Tiwanaku colors for designs: white, black, orange, and sometimes gray, on an orange, red or red-brown background slip. Both white and black are used for figural elements, not just outlines. CVCT color use is consistent with Tiwanaku; that is, motifs that are typically orange with black in Tiwanaku are painted orange with black in CVCT as well.

However, while CVCT color use is consistent with Tiwanaku, the hues are frequently distinguishable. For example, CVCT does not have the deep red base slip common to the Tiwanaku heartland, instead using red-brown to light orange. Local paint pigments are distinct from those of the highlands as well; CVCT orange is tanner than in the highlands, the white is more of a cream, the black is more sepia, the gray is greener, etc. These differences are likely due to the mineral sources available in Cochabamba but may also reflect local preference.

The color gray, in particular, has been considered by some to be a Cochabamba addition to the Tiwanaku repertoire (Burkholder 1997; Janusek 2003b; Vetters 1995). Gray is suggested to have spread from the Omereque and Caraparial styles, where it is common, either directly to Tiwanaku or via early adoption of gray in the Cochabamba Tiwanaku styles and then spreading to the highlands. While gray is a color found in the CVCT style, it is not clear whether this predates the adoption of gray in the highlands.

Symmetries. CVCT uses the same range of symmetry patterns used at Tiwanaku, while a number of the symmetry patterns typical of other Cochabamba styles are not employed. Main motifs in the Tiwanaku style are usually repeated by simple translation along a horizontal axis and are repeated without color counterchange; this is the case for the CVCT as well (Figure 4.23a), particularly for anthrozoomorphic designs. Tiwanaku does have some complex symmetry patterns attached to specific motifs such as stepped triangular heads, angular faces, etc. These symmetries can include color counterchange, rotation and reflection, and many are likely based on textile designs. CVCT seems to use the same complex symmetries with the same motifs as Tiwanaku (Figure 4.23b and 4.23c).

Interestingly, in the case of widespread motifs such as the step volute and continuous volute found in Tiwanaku and Cochabamba regional styles, the CVCT version follows the Tiwanaku pattern of typically no color counterchange rather than the two color counterchange common in the regional Cochabamba styles.

Design Structure, Dividing Lines and Design Placement. Design structure, the spatial arrangement of designs on vessels, is significant since structural characteristics are subtle and less likely to be imitated without close social contact or training (Bowser 2002; Rice 1987:264-266). Overall, CVCT divides vessels into the same spatial zones as Tiwanaku and uses the same types of dividing bands (or lack thereof) to demark design spaces. For instance, a highly characteristic dividing band common to both Tiwanaku and CVCT is a configuration of orange, black and white horizontal stripes (Figure 4.24); in addition, both Tiwanaku and CVCT vessels typically have no rim band or use a single black stripe.

Design placement on *keros* may be an aspect of CVCT that differs from the Tiwanaku style. For Tiwanaku *keros*, the main motif is on the torus or the lower register, with the top register (between the torus and the rim) usually left undecorated during Tiwanaku IV and only occasionally decorated during Tiwanaku V (Janusek 2003b:62). In contrast, decoration in the upper register is fairly common in CVCT. However, it is worth noting that Tiwanaku *keros* from Moquegua (Goldstein 2005:151, 159) and Iwawi (Burkholder 1997:188) also have decoration in the upper register, so this may not be a strictly Cochabamba variant.

Central Valley Examples of Blending. Some CVCT vessels do show both Tiwanaku and non-Tiwanaku elements on a single vessel. For instance, Omereque and

Caraparial black-white-black rim bands (see Figures 4.5 and 4.6) are occasionally found on otherwise CVCT vessels. In some vessels, specific parts of the design space display non-Tiwanaku motifs with the remainder following Tiwanaku rules. Examples of such mixes are rare in the Central Valley.

CVCT Technological Style

Technological style is an important part of ceramic analysis. It includes all aspects of how the clay is prepared and fired, what tools appear to have been used, how strong the final vessels are, how thick or thin, how light or heavy. The precision with which a style is copied, whether limited to the more obvious aspects of form or extending to the more subtle aspects of forming techniques, is a good indicator of whether the style diffused or spread through instruction from potters fluent in the style (Bowser 2002; Gosselain 1992, 1998; Rice 1987). In general, production techniques for the CVCT style are clearly similar to Tiwanaku production techniques and do represent a departure from preexisting local styles.

Pastes and temper. CVCT servingware pastes are compact and use finer temper than is typical of most Cochabamba styles. The colors of the pastes range from dark orange to brownish-red but do not reach the deep red of some commonly used highland clays. CVCT pastes typically have no temper or use very fine sand and/or very fine grog.

Evenness and Symmetricality. CVCT vessels tend to be more even and symmetrical than most vessels of the Late Formative local styles. These traits can be seen in the overall vessel form, the evenness of the interior and exterior surfaces, and the

uniform thickness of the vessel walls. In addition, CVCT painted decoration is more regular than that of its Late Formative counterparts (Figure 4.25). For example, horizontal and vertical bands are consistently parallel or perpendicular to the base, and repetitions of the major motif are the same size, rather than one repetition being squeezed or abbreviated.

Burnishing. CVCT vessels, particularly *keros*, show a more consistently shiny surface than local styles. Quillacollo, Tupuraya and Sauces style fineware vessels are smoothed though not burnished. The hybrid Cochapampa style tends to be only roughly burnished; burnishing marks are easily visible, and the surface is somewhat irregular. Omereque and Caraparial vessels are burnished, but frequently the burnishing is done before the application of the painted design such that the painted design is matte over a burnished base slip.

Firing. Firing within the CVCT style varied, resulting in vessels that could be completely oxidized, oxidized with a reduced gray core or completely reduced with only the surface oxidized – a pattern quite similar to that found at Tiwanaku (Janusek 2003b:82). Vessel hardness is a key characteristic of the CVCT style. CVCT firing techniques combined with other technological choices such as paste and temper result in vessels that are notably harder and more vitrified than the fineware of other local styles; they are also quite distinctive to the touch and produce more of a clink sound rather than a dull thud when tapped.

Differentiation of Fineware. There is a heightened differentiation between CVCT fineware and corresponding utilitarian vessels that is not found in local Late Formative styles. For example, in a comparison of Quillacollo style serving and utilitarian wares,

the painted serving bowls are very similar in texture, finish and paste to the larger cooking and storage vessels (Figure 4.26a). For the CVCT style, the difference between fineware and utilitarian ware is quite marked; the utilitarian ware is only smoothed with no burnishing, while the serving ware is well-smoothed, slipped and burnished (Figure 4.26b).

The Tactile and Ceremonial Nature of Technological Style. While we can say that Tiwanaku ceramics were harder, shinier, more symmetrical, etc., than local and regional Cochabamba styles, this characterization does not fully express the tactile nature of the Tiwanaku style, which enables one to recognize a Tiwanaku or CVCT vessel simply by touch. The technology used to produce the CVCT wares did not merely result in vessels that "looked" Tiwanaku but in vessels that "felt" Tiwanaku. I believe that these tactile elements were a key aspect of the style that was intentionally reproduced. This argument is strengthened by the fact that many of the production methods used to manufacture CVCT vessels required far more effort than those employed for the majority of fineware vessels of the local styles. Creating symmetrical vessels with thin, even walls, fine temper, carefully applied designs, painstaking burnishing and controlled firing to produce a distinctly hard vessel requires additional investments of time and energy and the acquisition of technical skills. As Lechtman (1977, 1988) suggests for Andean metal production and Conklin (2004a, 2004b, 2004c, 2004d) suggests for textiles, the production steps required to make artifacts can be seen as a set of complex rituals with specific meanings. In this context, the extra steps and effort necessary to make Tiwanaku and CVCT fineware may have been an integral part of its ritual value, adding power to these already symbolically charged vessels.

CVCT Style of Practice

When we examine the CVCT style, we need to look not only at the vessels themselves but also at whether the practices associated with eating and drinking are similar to those at Tiwanaku.

One hallmark of Tiwanaku ceramics at Tiwanaku and other key peripheries is a great increase in the quantity of servingware from the Late Formative. During the Middle Horizon, servingware ranged from 19 to 25 percent of assemblages at Tiwanaku and from 7 to 35 percent in sites around the Southern Titicaca Basin (Janusek 2004:130). This is a considerable increase from the Late Formative, when decorated Qeya style wares typically formed only 3 percent of the total assemblage (Janusek 2003b:50). We see a similar increase in the Central Valley sites where the level of painted servingware is 2 to 3 percent during the Late Formative, 5 to 8 percent during the Illataco Phase and approximately 20 percent during the Piñami Phase (Figure 4.27).

A second characteristic of Tiwanaku servingware use is that it is not only found in elite or ritual contexts but instead is widely dispersed and found in high frequencies even in domestic contexts (Bermann 1990; Burkholder 1997; Goldstein 2005; Janusek 2002, 2003b, 2004; Rivera Casanovas 2003). Though some forms and motifs do appear to have been restricted to elite or ceremonial contexts, such as *escudillas* and recurved *tazones* (Alconini Mujíca 1993; Couture 2002; Janusek 2003b), most forms, including ritual vessels such as *incensarios*, are not restricted. At Piñami, the pattern is the same; high

percentages of CVCT servingware are found in almost all domestic contexts and as offerings in the majority of burials.

A third hallmark of Tiwanaku practice is the high value placed on drinking vessels, particularly the *kero*, which is one of the most decorated and finely made vessel types and is considered to be particularly symbolic of the Tiwanaku state (Goldstein 2003, 2005; Janusek 2002, 2003b:60). (The symbolic importance of drinking vessels will be addressed in detail in Chapter 5.) *Keros* were rare in the highlands during the Late Formative but are ubiquitous during the Middle Horizon in ceremonial, domestic and mortuary contexts (Alconini Mujíca 1993; Goldstein 2003; Janusek 2003b). In the Cochabamba region, *keros* were present from the Early Formative (Anderson 2009; Brockington et al. 1995; Döllerer 2013; Pereira Herrera et al. 1992). During the Middle Horizon, we see a precipitous increase in *keros* in both domestic and mortuary contexts, with *keros* becoming one of the two most common servingware forms in the CVCT style.

Overall, the pattern of use of CVCT style ware is remarkably similar to that found at Tiwanaku sites and indicates substantial changes in local household eating and drinking practices from the Central Valley Late Formative.

Conclusion

The central purpose of this chapter has been to examine the CVCT style and determine whether, as a whole, it falls within the range of variation typical for ceramics of the

Tiwanaku core and Tiwanaku peripheries, or whether it should instead be considered a "derived" style, combining Tiwanaku and local Cochabamba traits. To that end, I have examined the Tiwanaku and Cochabamba local styles and compared them to the forms, iconography, technology and practice of the CVCT wares. I find that, overall, the CVCT style is highly similar to the Tiwanaku style and should be considered to fall within the range of variation typical of the Tiwanaku core and key peripheries. Despite the considerable distance between the regions, CVCT is not a "derived" style loosely mimicking prestigious goods from afar. Instead it should be considered a Tiwanaku style on par with the Tiwanaku style from other peripheries such as Moquegua and Lukurmata.

While CVCT vessels can display particular attributes that enable them to be "read" as Tiwanaku vessels from Cochabamba, in general CVCT faithfully follows the highland Tiwanaku style. The forms, motifs and color are generally consistent (except as mentioned above), and, notably, some of the less obvious traits of the Tiwanaku style—the symmetry, banding and aspects of the technology of production—are very similar, resulting in vessels that both look and feel "Tiwanaku". Perhaps even more significantly, it is clear that not only was the ceramic style adopted, but so was the whole behavior surrounding the use of Tiwanaku pottery, as evidenced by the high percentages and varied use contexts of CVCT fineware. Furthermore, the use of CVCT style vessels by all households over hundreds of years provided continual, highly visible and tactile reminders of ties to Tiwanaku.

Expanding the implication of this ceramic transition using ethnoarchaeological models can provide clues as to social change in the Central Valley. A dramatic shift in ceramic vessel style and context of use, such as we have seen here, can indicate a

wholesale replacement of local peoples by immigrants, but this does not appear to have been the case in the Central Valley of Cochabamba. At both Piñami and Quillacollo, the variety of local ceramic styles that continue during the transitional Illataco Phase suggests that at least part of the pre-existing population stayed in the valley.

Though the fineware data does not support a model of complete replacement, neither does it support a model of ceramic change solely through long-distance diffusion. Indeed, as mentioned above, ethnoarchaeological studies of ceramic production show that the most easily visible traits, such as basic form, color and central motifs, are most easily transferred via diffusion. Less visible traits – technologies of forming and firing, and details of iconography such as symmetries, banding and outlining – are harder to "see" and imitate without instruction from a potter trained in those techniques (Bowser 2002; Gosselain 1992, 1998; Rice 1987). The conformity of the early CVCT to Tiwanaku norms, even in less prominent details, suggests that early producers of CVCT had intimate knowledge of Tiwanaku ceramic canons and production techniques. The similarity in use practices is also indicative of detailed knowledge and conscious imitation of highland traditions. Thus, the ceramic fineware data support the model that during the Middle Horizon, a significant number of Tiwanakans, including traders and colonists, immigrated to the Western Valleys, bringing with them new material culture and an ideology and worldview that quickly spread and gained acceptance.

Examining the changes in fineware pottery over time provides details on how local acceptance progressed. We can say that the increased inter-regional trade of the Illataco Phase was pivotal for early changes. While there had been long-distance trade in Cochabamba since at least the Early Formative (Brockington et al. 1995; Döllerer 2013;

Gabelmann 2005), the variety and quantity of foreign ceramics present during the Illataco Phase increased dramatically. However, trade is not the whole story. Despite the variety of styles present, Tiwanaku serving wares dominated in the Central Valley even during the Illataco Phase and, counting Tiwanaku imports and CVCT together, comprised over 60 percent of the serving ware for the phase. Significantly, CVCT is not the end result of an extended period of trade, nor does CVCT develop gradually with early experimentation followed by greater virtuosity; instead, the style employs Tiwanaku rules and techniques from the beginning. For these reasons, I believe that CVCT ceramics were most likely the result of transplanted potters, or locals directly trained by Tiwanaku potters, early on in this transitional phase.

By the Piñami Phase, the association between the Central Valley and Tiwanaku was very strong. The most noteworthy characteristics of the Piñami Phase assemblage are the enormous jump in the frequency of servingware and the transition from multiple decorated styles to complete dominance of the CVCT style.

Thus, in the ceramic fineware evidence we see an example of the effectiveness of the Tiwanaku mystique. Materially and symbolically, the CVCT expressed transforming local social identities and political alliances built upon a base of Tiwanaku ideology, identity and practice.

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[1] This chapter is based substantially on my article, The Tiwanaku Style in Cochabamba: How "Derived" Was It? In *The Southern Andean Iconographic Series*, edited by William Isbell, Mauricio Uribe, Anne Tiballi and Edward Zegarra, pp. 239-274. Cotsen Institute of Archaeology Press, 2018. Material used with permission of the Cotsen Institute of Archaeology Press.

[2] Piñami and Quillacollo are located in the Central Valley, at least 50 km closer to Tiwanaku than Arani (AN-1), the site that Bennett excavated and used as a basis for his definition of the Derived Tiwanaku style.

[3] The Cochapampa style was first identified and named by Céspedes Paz (2000). Döllerer also studied the style but named it the Parotani style (Döllerer 2004). I use the original name of Cochapampa.

Table List for Chapter 4

Figure List for Chapter 4

Chapter 5: Tiwanaku Transformation of Local Drinking Patterns[1]

With the rise of the Tiwanaku state, a distinctive ceramic style developed that included a new and complex ceramic assemblage. The transition to this new assemblage occurred quickly and spread throughout the heartland of Tiwanaku. As discussed in Chapter 4, one of the most common new forms was a tall, finely made drinking cup, the *kero*, generally agreed to have been used for drinking fermented beverages such as maize or quinoa beer. The high frequency of *keros* found in a wide variety of Tiwanaku contexts attests to the popularity and widespread consumption of beers at all social levels.

While beer could be made from many grains and fruits (Goldstein, Colman and Williams 2009; Goldstein 2003; and Hayashida 2009), the evidence suggests that maize beer, or *chicha*, was the beer of choice during Tiwanaku hegemony. Prior to Tiwanaku, maize was found in limited quantities in the southern Lake Titicaca Basin. However, with the advent of the state, the distribution of maize increased substantially, especially at Tiwanaku, where it was found in quantities that are surprisingly high, considering the difficulty of growing maize in a high-elevation environment (Wright et al. 2003:390, 393, 402).

Goldstein (2003) argues that the popularity of maize *chicha* was a driving force in Tiwanaku's political economy—one that pushed it outward toward lower-elevation maize-growing areas, such as Moquegua and Cochabamba, outside its heartland. He considers maize *chicha* so significant that he has coined the phrase "*chicha* economy" to

describe the phenomenon. Hastorf and her colleagues (Hastorf et al. 2006) also support the idea of an expanding *chicha* focused economy. They examined maize remains in highland contexts and identified three major maize varieties at Tiwanaku during the Middle Horizon. One variety was consistent with maize found at Moquegua, another was consistent with varieties found at Cochabamba, and the last one was unidentified. This evidence is highly suggestive that maize was being imported to Tiwanaku from other regions and that one of the key exporting regions during the Middle Horizon was Cochabamba. The importance of maize in the Central Valley during the Middle Horizon is confirmed by studies from Piñami. As will be discussed in more detail in following chapters, macrobotanical evidence and isotope analysis of human remains indicate heavy maize consumption at Piñami during the Middle Horizon.

There were distinctions, however, between Moquegua and Cochabamba in the presence of pre-Tiwanaku drinking traditions. Apparently, when Tiwanaku colonists arrived in Moquegua, they brought the *chicha* economy to an area that had no clear pre-existing drinking tradition (Goldstein 2003). Goldstein argues that the widespread evidence for drinking in Moquegua during the Middle Horizon is due to the spread of Tiwanaku's "mania for maize beer" (2003:144), that Tiwanaku drinking vessels and paraphernalia were adopted simultaneously as an important part of the correct way to serve and drink this desirable new beverage and that it is impossible to separate the two developments.

As in other regions that Tiwanaku controlled or influenced, Tiwanaku-style drinking vessels became common in Cochabamba during the Middle Horizon. However, Cochabamba is distinct in that drinking fermented beverages was a long-standing local

tradition *prior* to the arrival of Tiwanaku. Thus, in Cochabamba we have a unique opportunity to examine the power and attraction of Tiwanaku drinking paraphernalia and practices *independent* of the introduction of drinking itself.

In the last chapter, I examined the influence of the Tiwanaku decorated ceramic style; in this chapter, I specifically focus on the social power of the Tiwanaku drinking practices through evidence from Piñami. I concentrate primarily on ceramic drinking vessels, covering changes in style, archaeological context, and importance. I find that significant changes occurred in local drinking *practices* when the Central Valley was integrated into the Tiwanaku political economy.

The evidence from both household and mortuary contexts from Piñami and Quillacollo demonstrate that Tiwanaku drinking practices were closely emulated in Cochabamba and the new practices served to integrate Cochabamba into the Tiwanaku political economy. The adopted Tiwanaku-style drinking customs were practiced in the Cochabamba Central Valley until the end of the Middle Horizon, suggesting that drinking rituals were important to the expansion and long-term stability of the Tiwanaku state in this region.

Theoretical Aspects of Drinking and Social Change

Food and drink reflect more than the physical need for survival; rather, the ways in which they are prepared, served, and consumed are integral to social practices that affirm,

contest, and transform social identities. Many researchers have noted that fermented beverages are unusually important in political interactions and are generally considered to confer higher prestige and to be more essential in politically charged contexts than are other drinks (Bowser 2000, 2002; Dietler 1990, 2001, 2003; Dietler and Hayden 2001). Thus, the consumption of alcoholic beverages often becomes a highly ritualized and politicized practice.

While any vessel that can hold liquid can be used for drinking fermented beverages, the use of specialized drinking vessels accentuates the ceremony of the occasion (Hayden 2001). Highly elaborated drinking vessels are common in societies of all scales. By their form and decoration, serving vessels are useful for displaying symbolic messages of identity, rank, belief, social relationships and political alliance – messages that are conveyed to all participants during drinking.

In his seminal article, Dietler (1990) discusses how new beverages and drinking customs may radically affect the political economy of a recipient society and details circumstances under which drinking practices would most likely be emulated. He shows that emulation is dependent on a variety of social factors, including whether there was a pre-existing drinking practice, whether access to the drink or drinking paraphernalia is restricted, the social relationship between the donor and recipient, the intensity of interactions and the prestige of the adopted drinking traditions. Dietler asserts that when new drinking practices, as opposed to a new beverage, are introduced, these practices are often adopted by the recipient of the new practice to forge symbolic ties (1990:379). He further argues, *"Complete adoption* of drinking patterns and beliefs of a donor society is likely to occur *only* when contacts are close and pervasive, and when . . . cultural identity

[of the recipient] comes to be defined vis-à-vis the donor society" (Dietler 1990:378; emphasis added). Thus, changes from pre-existing drinking practices in Cochabamba to those that highly emulate Tiwanaku would imply that the people of Cochabamba were symbolically associating themselves with Tiwanaku and actively adopting a Tiwanaku cultural identity. It would also suggest close, personal interactions among local residents and people of Tiwanaku origin or heritage.

While many archaeologists have emphasized the importance of elite drinking behaviors, especially in feasting contexts, it is important to note that drinking practices among the non-elite at the household level can also have political ramifications. Bowser's work is helpful for understanding this process (Bowser 2000, 2002, 2004; Bowser and Patton 2004). She conducted her research in a small-scale multiethnic community in Ecuador where manioc *chicha* is the staple beverage, women make and decorate their families' *chicha* bowls, and *chicha* is served daily to family and visiting guests. Bowser found that politics are conducted in household contexts during formal and informal visiting, and these visits are a critical venue for community decision making and consensus building. *Chicha* vessels are very important in these contexts. They are part of the social etiquette of hospitality and reciprocity, and the designs portrayed on the vessels subtly signify current political alliances and in-group/out-group information that other members of the community can "read" quite effectively. It may thus be at the intimate level of the household that the decisions of individuals to adopt or resist social change can be best seen. In the case of Piñami, where new drinking practices and associated material culture rather than a new drink were introduced, an examination of what was emulated, the contexts in which it was emulated and the extent to which it was

emulated provides insight into the social processes and motivations of the people of Piñami as they adopted, transformed, and later abandoned specific Tiwanaku drinking practices.

Drinking Traditions at Tiwanaku

The Tiwanaku polity (AD 500-1100) was the only state-level society to develop in the south-central Andes. By late in the Late Formative, before the foundation of the state, the site of Tiwanaku already had a substantial residential population and a monumental ceremonial core (Janusek 2004; Kolata 1993, 2003; Stanish 2003). The pre-state Qeya-style ceramics in use at the time included few decorated vessels, and those few were found primarily in ritual contexts rather than in residential areas (Janusek 2003b:50; 2004:120). *Kero* forms were present in the Qeya assemblage but were found only in very low frequencies and were rare to non-existent at Tiwanaku itself (Janusek 2003b:49-50).

Around AD 500, the Tiwanaku state emerged, accompanied by the new state art style and an abrupt change in the ceramic assemblage in the Tiwanaku heartland (Janusek 2003b:56). State ceramics included many new forms (see Janusek 2003b:57, Fig. 3.27); the assemblage as a whole was visually distinct, with a red base color, polychrome decoration and bold and distinctive iconography.

In the Tiwanaku assemblage, there is no form that stands out as more symbolic of the Tiwanaku state than the *kero* (Goldstein 2003, 2005; Janusek 2003b). The *kero* is a

finely made drinking cup used for fermented beverages (Goldstein 2003; Janusek 2003b). *Keros* are more ostentatious than a typical cup, and their size suggests that they were designed for public display. Janusek reports that a typical *kero* at Tiwanaku stands 16 to 20 centimeters high and opens to a rim diameter of 12 to 18 centimeters (mean = 14 centimeters) (Janusek 2003b:60). It is a tall hyperboloid form, similar to a modern tumbler, often with a single or double raised horizontal band two-thirds of the way up the vessel. *Keros* also tend to be more finely finished and highly burnished than other serving ware forms and portray complex iconography (Janusek 2003b:60-61).

In terms of frequency, *keros* are one of the most common serving ware forms found in Tiwanaku domestic contexts, often representing up to 30 percent of total serving wares (Couture 2002:209, 277; Janusek 2002:46; Rivera Casanovas 1994). While elites tended to have more finely made drinking vessels (Couture 2002), the high frequencies of drinking vessels and brewing jars found in non-elite domestic contexts show that elites neither controlled access to drinking nor had a monopoly on ritual drinking. Instead, *chicha* drinking using Tiwanaku-style *keros* was a common practice.[2]

Pre-Tiwanaku Drinking Traditions at Cochabamba

To better understand the impact of Tiwanaku on local drinking customs, it is important to examine the evidence for drink in Cochabamba prior to the Middle Horizon.

Early and Middle Formative

Early and Middle Formative ceramics are characterized by slipped vessels with no painted decoration. This style, the Monochrome, includes a number of forms related to drinking and production of fermented beverages, such as drinking vessels and liquid storage and transport jars. Formative drinking vessels are variable in shape but are taller than they are wide, and a few of them show the characteristic hyperboloid shape of the later *kero* (Figures 5.1 and 5.2). *Kero*-like drinking vessels began to be used in the Cochabamba valleys in the Early Formative, considerably earlier than in other areas of the south-central Andes (Goldstein 2003; Janusek 2003b, 2004), and it has been suggested that the Tiwanaku *kero* is derived from Cochabamba precursors (Céspedes Paz 2000; Céspedes Paz et al. 1994; Pereira Herrera et al. 2001).

Some of the earliest Cochabamba *keros* found in well-provenienced contexts are from the site of Conchupata in the Mizque Valley (see map, Figure 1.3), a cemetery dated to the Early Formative (~1200-600 BC) (Pereira Herrera et al. 1992). Of fifteen burials with offerings, two had tall drinking vessels. Monochrome-style vessels for liquid storage, transport, and fermentation also have been recovered by excavations in Mizque (Walter 1966), and unprovenienced Monochrome drinking and storage vessels are included in the Cochabamba Archaeological Museum collection (Figure 5.1). Overall, Monochrome drinking vessels are rare in frequency and come from mortuary rather than domestic contexts (Anderson and Céspedes Paz 1998; Brockington et al. 1985; Brockington et al. 1995; Céspedes Paz et al. 1994; Gabelmann 2005).

Late Formative

The Late Formative is defined in the Cochabamba region by the appearance of distinctive painted ceramic styles using geometric iconography that co-occurred with the Monochrome style including Tupuraya, Sauces, Quillacollo, and Mojocoya styles (see Chapter 4 for descriptions) (Anderson and Céspedes Paz 1998; Céspedes Paz et al. 1994; Döllerer 2004; Ibarra Grasso 1973; Ibarra Grasso and Querejazu Lewis 1986; Pereira Herrera and Brockington 2005). *Kero* forms have been found in all of the new painted styles except the Quillacollo style. Late Formative painted *keros* vary less in shape than do Monochrome vessels, ranging from straight-sided to slightly flared (Döllerer 2004). In addition to drinking vessels, the Late Formative assemblages include a variety of utilitarian vessels that were clearly for liquid storage and transport. Yet, as in the Early and Middle Formative, *kero*-shaped drinking vessels continue to be rare (Brockington et al. 1985; Céspedes Paz et al. 1994; Döllerer 2004).

Little botanical evidence is available for the Late Formative, so it is not known which plants were most likely used for fermentation or whether maize *chicha* had become more common.

Formative Summary

The presence during the Formative Period of *kero*-shaped drinking vessels, together with vessels likely used for liquid storage, transport and fermentation, suggests that fermented drink was a Cochabamba tradition hundreds of years before drinking vessels were used in the highlands around Tiwanaku. However, Formative drinking vessels are found in very

low frequencies and primarily in mortuary contexts.

The limited contexts and frequency of *kero*-like drinking vessels in the Formative do not necessarily imply that consumption of fermented beverages was restricted to special contexts or uses. Certainly, beers could have been served in more multipurpose forms of pottery, such as bowls, or in vessels made of materials that do not preserve, such as wood or gourds. In any case, throughout the Formative, *kero*-like ceramic drinking vessels were not part of regular domestic practice but instead were associated more with specific ceremonial contexts and possibly were available only to certain individuals.

Middle Horizon Drinking Traditions in Cochabamba

Illataco Phase Domestic Contexts

The Illataco Phase can be characterized by evidence of increasingly open trade networks in comparison to the Late Formative (Anderson 1999, 2013; Anderson and Céspedes Paz 1998; Céspedes Paz 2000), as demonstrated by the increased variety in ceramic styles found together, which includes Tiwanaku imports, regional imports, continuation of local Late Formative painted styles and a new local style called Cochapampa (Céspedes Paz 2000). Analysis of the ceramic drinking vessels during this transitional phase hints that drinking vessels and practices may have been key in local adoption and emulation of Tiwanaku. During the Illataco Phase, *keros* became common in domestic contexts, a

pattern quite different from that found in the Formative contexts, where they were rare to nonexistent. Early in the Illataco Phase, *keros* at Piñami were found in a variety of locally produced and imported styles, including imported Tiwanaku redware and blackware, the CVCT, Cochapampa and Sauces. Toward the end of the Illataco Phase and throughout the Piñami Phase, the CVCT style became dominant and other local and imported styles diminished, as demonstrated in the last chapter. During this transitional phase, *kero* forms decorated with Tiwanaku iconography were adopted earlier and with greater frequency than were other serving forms.

Piñami Phase Domestic Contexts

One of the clearest indicators of the impact of Tiwanaku is the increase in frequency of CVCT style serving/ceremonial ware which began in the Illataco Phase but became the dominant style throughout the Piñami Phase. The frequency of CVCT style fragments increased to levels similar to those found at Tiwanaku habitation sites in the southern Titicaca Basin. The increase in drinking vessels at Piñami was particularly dramatic as indicated by their high representation in the serving ware, averaging 25 to 40 percent of the total. By the Piñami Phase, not only were drinking vessels common, but also there was a variety of sizes and forms, suggesting a range of associated drinking rituals.

The three most common drinking vessel forms in the CVCT style were a standard *kero*, similar in proportion to those found at Tiwanaku, a taller thinner *kero* (Figures 5.3 and 5.4) and the *vaso embudo* (Figure 5.5) or funnel-shaped cup. All three of these drinking vessel forms had the capacity to hold substantial amounts of liquid, averaging

810 ml, 1225 ml and 675 ml, respectively (Table 5.1). Both the tall *kero* and the *vaso embudo* are uncommon at Tiwanaku and are characteristic of Cochabamba-Tiwanaku drinking vessels (Janusek 2003b).

Table 5.1. Comparison of Drinking Vessel Dimensions and Volumes.

Drinking Vessel	Average Height	Average Rim Diameter	Average Difference Between Height and Rim Diameter	Average Volume	Sample Size
Standard *keros*	16.2 cm	14.3 cm	1.9 cm	810 ml	N = 17
Tall *keros*	21.0 cm	16.0 cm	5.0 cm	1225 ml	N = 14
Vaso embudo	17.3 cm	13.6 cm	3.7 cm	675 ml	N = 22
Tiwanaku pitcher				1050 ml	N = 3
LIP small *keros*	12.4 cm	10.0 cm	2.4 cm	315 ml	N = 15
LIP pitchers				3 – 5 liters	N = 5
Modern *chicha* serving gourds from *chicherias*				250-500 ml	N = 10

The tall *kero* has a rim diameter similar to that of the standard *kero* but is taller and has a thinner middle section (Table 5.1). Some of these tall *keros* are extra large with measurements up to 25 centimeters in height, 18 centimeters in diameter, and 1.5 liters in volume (Figure 5.4). The extra-large *keros* were uncommon at Piñami, and due to their size were most likely used in feasting contexts (Hayden 2001).

The *vaso embudo* was the only non-Tiwanaku form adopted into the CVCT fineware assemblage. This funnel-shaped vessel was common in local styles east and south of the Central Valley of Cochabamba (Anderson 1997; Döllerer 2004; Ibarra Grasso 1973; Ibarra Grasso and Querejazu Lewis 1986; Janusek 2003b; Pereira Herrera

and Brockington 2005). The form has an extremely small base such that it cannot be set down (Figure 5.5) and is sometimes referred to as a *vaso embudo* (offering vessel) since many were made with holes in their bases such that any liquid would spill out continuously. Despite its non-Tiwanaku antecedents, when the *vaso embudo* was adopted as part of the CVCT, it was produced using Tiwanaku iconography and technology.

Summary of Middle Horizon Domestic Evidence

CVCT serving wares quickly replaced local style serving wares. *Kero* forms transitioned to the CVCT style more completely at an earlier date than did other vessel forms, suggesting that Tiwanaku-style drinking rituals were important in the early process of assimilation.

Tiwanaku-style drinking vessels became an essential part of the domestic assemblage and were found in all households in high percentages. This change, from low percentages of *keros* to high percentages and from specific and restricted contexts to being ubiquitous, shows that not only Tiwanaku ceramic styles were being adopted but also the associated Tiwanaku practices and values. Tiwanaku-style drinking vessels were apparently seen as necessary in *household* hospitality rituals. Overall, this increased frequency and widespread presence denote a high degree of acceptance and emulation of Tiwanaku drinking traditions, signifying a change to a Tiwanaku-centered social identity.

Mortuary Contexts

Mortuary data provide a different way to understand how Tiwanaku drinking customs were adopted in western Cochabamba. By relating drinking vessels to individuals in mortuary contexts, we can examine not only whether there were changes in drinking vessel frequency and style preferences, but also whether these preferences were patterned with regard to sex, age and status. Additionally, mortuary traditions tend to be quite conservative, so transitions in offering customs may be indicative of significant ideological and ritual shifts that transcend the quotidian domestic sphere. Mortuary evidence will be covered in detail in the next chapter; here, I focus on the frequency and style of drinking vessels found as burial offerings.

Frequency of Tiwanaku Style Drinking Vessels. The Piñami excavations produced thirty-six burials with undisturbed offerings. In Chapter 6, I argue that these burials should be divided into two temporal groupings: Early Middle Horizon and Late Middle Horizon. The twenty-five Early burials come from late in the Illataco Phase to Early Piñami Phase contexts. The eleven Late burials come from Late Piñami Phase contexts. Pottery offerings were primarily serving wares such as drinking vessels (*keros* and *vasos embudos*), serving bowls, pitchers, small jars, and ritual vessels, or small utilitarian vessels such as *ollitas* or rustic *vasijas*.

Ceramic drinking vessels, especially *kero* forms, were frequent grave offerings especially in the early Middle Horizon (Table 5.2). Of the twenty-five Early burials, twenty-four had ceramic offerings, totaling 104 vessels and averaging 4.3 vessels per burial. Of these vessels, 29% (n=30) were drinking vessels. These drinking vessels were widespread in Early burials as 63% of burials with ceramic offerings had at least one drinking vessel.

Late burials contained substantially fewer offerings (15 total, averaging 1.4 vessels per burial); 6 out of 11 had no offering vessels. Of the 15 offerings vessels, only 2 were drinking vessels, a drop to 13% of the total ceramic offerings.

Table 5.2. Frequency of Drinking Vessel Offerings by Time Period.

Time Period	Total Burials	Burials with Ceramic Offerings	Total Vessels		Burials with Drinking Vessels (% of burials with at least one drinking vessel)	Drinking Vessel Offerings (% of total vessels that are drinking vessels)
Early Middle Horizon	25	24	104		15 (63% of 24)	30 (29% of 104)
Late Middle Horizon	11	5	15		2 (40% of 5)	2 (13% of 15)
Total	36	29	119			

The Early gravelots included both local and Tiwanaku style offerings. Subdividing the Early gravelots by ceramic style, we find that gravelots with only local style offerings were much less likely to include drinking vessels than were those with some or all Tiwanaku style offerings. Of the five burials with solely local offerings, only one had a drinking vessel (20%), whereas of the nine burials with all Tiwanaku offerings, 78% had at least one drinking vessel; of the ten burials with mixed Tiwanaku and local offerings, 70% had at least one drinking vessel (Table 5.3).

Table 5.3. Drinking Vessel Styles in Early Burial Offerings.

Styles of Vessels in	Number of	Number of Burials with Drinking

Burials	Burials	Vessels (% of burials with drinking vessels)
Local Styles Only	5	1 (20% of 5)
Mix of Local and Tiwanaku Styles	10	7 (70% of 10)
Tiwanaku Styles Only	9	7 (78% of 9)
Totals	24	15 (63% of 24)

Examining the ceramic offerings from Early burials by vessel form, we can see that drinking vessels (both *keros* and *vasos embudos*) were more likely to have Tiwanaku style decoration than were other vessel forms. In particular, the Tiwanaku style was more closely associated with *keros* than with any other vessel form aside from ritual vessels. Of the *keros* from complete Early burials, 85% were Tiwanaku style. Likewise, *vasos embudos* were predominately Tiwanaku style (73%). By comparison, the percentage of Tiwanaku style in non-drinking vessel forms drops down to 41% (Table 5.4)

Table 5.4. Vessel Forms by Style in Middle Horizon Burials.

Style	Drinking Vessel Form		Other Vessel Forms				Total Vessels by Style
	Kero	*Vaso embudo*	Ritual	*Tazón*	Jar or pitcher	Utilitarian	
Tiwanaku	17 (85%)	11 (73%)	3 (100%)	13 (48%)	13 (36%)	0	57
Hybrid	1 (5%)	4 (27%)	0	2 (7%)	12 (33%)	0	15
Local	2 (10%)	0	0	7 (26%)	5 (14%)	0	18
Undetermined				5 (19%)	6 (17%)	18	29
Total vessels	20	15	3	27	36	18	119

Drinking Vessels by Age Category. To identify variation by age category, Bonnie Yoshida examined the remains of all the undisturbed single-occupant burials at Piñami.

Of these, there were thirty that could be aged and had complete offerings, including sixteen adults, four adolescents, five children, and five infants (see Appendix 3) (Table 5.5). The data show that drinking vessels were present as grave offerings for all age categories (ranging from 75% for adolescents to 20% for infants). While adult and adolescent burials had a higher frequency of drinking vessels than did those of children and infants, this disparity appears to simply reflect that adults received more offerings in general. Overall, there is no statistically significant difference between the presence of drinking vessels and age category.

Table 5.5. Relationship of Age and Drinking Vessel Offerings.

N=30 burials	Total Burials per Age Grade	Burials per Age Grade with Drinking Vessels	Percentage of Burials with Drinking Vessels
Adult	16	10	63%
Juvenile	4	3	75%
Child	5	2	40%
Infant	5	1	20%

Drinking Vessels and Status. Drinking vessels do appear to be related to status distinctions. Among the Early burials, two seemed to reflect higher status than the others. The remaining twenty-three Early burials contained on average 3.5 ceramic vessels per burial, but the two apparently higher status burials had substantially higher-than-average grave goods (twelve each of mixed styles) and contained types of offerings not found in other burials, such as strings of small stone beads and metal plaques. The greater number of offerings in these burials was not proportionate in all vessel categories. Instead, we found in these two tombs significantly more drinking vessels than other vessel types, with six drinking vessels (50% of all offerings) in one tomb, and seven (58%) in the other.

Interestingly, in each of the two higher status burials, the drinking vessels included four identical or almost identical drinking vessels deposited in pairs (Figures 5.6 and 5.7). In both cases they were *vaso embudo* forms. One set of four cups was decorated in the Caraparial style of the FarValleys and the other set used the Tiwanaku style. Pairs of cups have been found in mortuary, offering and feasting contexts in other Andean archaeological sites (Bray 2003:104-105; Cook and Glowacki 2003:195-196; Parssinen 2005; Rydén 1959), and pairs of cups are still used in the Andes today as part of feasting events where the host retains one cup and provides the other to each guest in turn (see Allen 2002, 2009; Cook and Glowacki 2003). The sets of cups in the two higher-status burials at Piñami may have been used in similar feasting events hosted by higher-status individuals, supporting the theory that feasting and drinking using special cups was an important part of social competition in Middle Horizon Cochabamba. Since these paired cups were in forms more associated with eastern Cochabamba and in one case used non-Tiwanaku iconography, these may represent the syncretization of local and Tiwanaku elite hospitality drinking rituals.

Drinking Vessels and Gender. Of the thirty-six complete burials, the sex of the individual could be determined "positively to possibly" in eleven burials: eight females and three males (all adults except for one adolescent female and one adolescent male) (Yoshida 2005). Despite the small sample size, especially for the males, we can say that both males and females were buried with drinking vessels (Table 5.6). However, examination by time period suggests a possible transformation over time. In the Early burials, all six females were buried with drinking vessels (Figure 5.8), and neither of the two males had drinking vessels. In the Late burials the findings are reversed. The one

Late male burial did have a drinking vessel and neither of the two Late female burials had any. Because we have no gender information for the majority of burials that had drinking vessels, the sample we are left with is very small, but it does show that *chicha* vessels were associated with women during the Early Middle Horizon (the Illataco through Early Piñami phases), and it suggests a possible decrease in association between women and drinking vessels by the Late Piñami Phase.

Table 5.6. Comparison of Drinking Vessels by Sex of the Deceased and by Middle Horizon Phase.

Time Period	Total Identified Male Burials	Male Burials with Drinking Vessels	% Males with Drinking Vessels	Total Identified Female Burials	Female Burials with Drinking Vessels	% Females with Drinking Vessels	Total
Early MH Burials	2	0	0%	6	6	100%	8
Late MH Burials	1	1	100%	2	0	0%	3
Total MH Burials	3	1	33%	8	6	75%	11

For Tiwanaku sites there was apparently gender inequality in association with drinking vessels. For example, the Tiwanaku colony of Moquegua, and the Tiwanaku site of Iwawi to the west of Tiwanaku show clear differences in grave offerings based on sex. At Iwawi, only male burials contained *keros* (JoEllen Burkholder, personal communication 2006).[3] Goldstein notes that at Moquegua, for the twenty-six individuals for whom sex could be determined, drinking vessels (*keros*) were found only in burials of men and of juveniles of undetermined sex (Goldstein 2005:254). Isotope analysis of the

Moquegua burials shows this sex-based difference applied to diet as well; men consumed more maize and meat than did women, while women consumed more leguminous plants (Goldstein 2005:254). Together, the analyses of grave goods and isotope data suggest that in Moquegua *chicha* drinking was primarily a male activity (Goldstein 2005:254). This pattern is reminiscent of that of the Inca at Mantaro, where a by-product of imperial expansion to Mantaro was the disruption of prior gender equality, resulting in males having greater access to *chicha* and meat (Goldstein 2003; Hastorf 1991).

The consistent evidence from Iwawi and Moquegua suggests that the male-female dichotomy may reflect gender roles in the Tiwanaku capital. If this is the case, Cochabamba individuals showed independence from Tiwanaku drinking norms for women during the Illataco through Early Piñami Phases, likely as a continuation of Cochabamba Formative drinking traditions. The lack of drinking vessels in Late Piñami Phase female burials may suggest increasing gender inequities over time, in keeping with Tiwanaku practices.

Summary of Middle Horizon Mortuary Evidence

The mortuary data both corroborate and complement the evidence from domestic contexts. Like the domestic data, mortuary evidence clearly shows the importance of drinking vessels. The majority of tombs excavated, regardless of age, status or (initially) gender, had at least one drinking vessel. Clearly, these vessels were highly valued as grave offerings, were readily accessible, and were not restricted to elites.

The Tiwanaku style appears to have been adopted more broadly and rapidly on drinking vessels, especially *keros*, than on other vessel types. During the transition, other

vessels often continued to follow local decorative styles and techniques of manufacture, whereas the preference for Tiwanaku-style *keros* was marked from the start. This evidence suggests that the ceremonial aspects of Tiwanaku, particularly ritualized drinking practices, were central to the transition from local to Tiwanaku practices in Cochabamba.

The high percentages of drinking vessels in the two higher-status tombs and the presence of special paired cups suggest that higher-status individuals held special responsibilities in feasting and further emphasize the importance of ceremonial drinking to social competition and hospitality.

The gender data point out one important way that Cochabamba did not initially follow Tiwanaku norms. For an extended period of time, drinking vessels were considered appropriate grave offerings for women, probably in keeping with pre-existing local gender roles. Over time, this association may have been reduced in ways more reflective of gender inequities at the Tiwanaku capital.

Post-Tiwanaku Drinking Patterns

The Late Intermediate Period began about AD 1100 with the dissolution of the Tiwanaku polity. With this dissolution, there was a dramatic shift in settlement patterns at and around the site of Tiwanaku. The population at the capital was greatly reduced, and numerous hamlets formed in the basin and throughout the region (Janusek 2004; Kolata

1993; Mathews 2003). The state ceramic style, including Tiwanaku iconography, technology and various vessel forms, was decisively abandoned. Dedicated drinking vessels such as *keros* disappeared completely, and the main serving ware forms that remained in use were *vasijas* and a rounded ellipsoid multipurpose bowls (*cuencos*) (Janusek 2003b:83-84).

In the Cochabamba region, the change in the ceramic styles in the Late Intermediate Period was notable. Material culture that heavily referenced Tiwanaku, represented by the use of Tiwanaku state symbols, was replaced by new ceramic forms with geometric iconography (Anderson 2010, 2015; Céspedes Paz 1982; Ibarra Grasso 1973; Ibarra Grasso and Querejazu Lewis 1986; Munoz Collazos 1993) (Figure 5.9). Manufacturing techniques for ceramics became less labor intensive, with less time and energy put into hardness, symmetry, vessel-wall thinness, smoothing and burnishing.

Unlike at Tiwanaku, dedicated drinking vessels in Cochabamba remained an important part of the domestic assemblage, though the social importance of their use appears to have declined. At Piñami, Late Intermediate drinking vessels and pitchers are found in domestic contexts and as burials offerings, including households and middens. However, there is a reduction in the quantity of serving ware and the percentage of drinking cups in the total ceramic assemblage.

Volumes for Late Intermediate drinking vessels were greatly reduced. Late Intermediate cups held only 220 ml to 450 ml (average ~315 ml), down to almost a fourth of the capacity of the Cochabamba-Tiwanaku tall *kero* (average volume 1,225 ml) or half the typical *vaso embudo* (average volume 675 ml).[4] The reduction in drinking vessel size was paralleled by a greater emphasis on serving pitchers. Pitchers, decorated with the

same slips and designs as the cups, increased in both size and frequency during the Late Intermediate Period. Pitchers could be quite large, with interior volumes of 3 to 5 liters, which could easily hold enough liquid to fill 9 to 15 average Late Intermediate cups (Figure 5.10). The pitchers were very likely used to serve *chicha*.[5]

In summary, during the Late Intermediate, Cochabamba discontinued its strong connection to the highlands. The people abandoned Tiwanaku iconography, and drinking cups were down-sized. Large serving pitchers and matching small cups usurped the prominent position formerly occupied by the ostentatious Tiwanaku drinking vessels.

In Cochabamba, as in other Tiwanaku peripheries like Moquegua (Goldstein 2003), the abandonment of Tiwanaku styles did not mean abandonment of drinking traditions. Instead, new traditions were formed that maintained the importance of drinking in the domestic arena.

Conclusion

Despite Cochabamba's pre-existing drinking traditions and *kero* forms, Tiwanaku influence radically transformed drinking practices and vessels in the Central Valley. Drinking vessels decorated with Tiwanaku symbols were quickly employed in the Central Valley and became part of a consistent pattern of ritual commensalism at the domestic level that lasted hundreds of years. The fact that Tiwanaku drinking customs, vessel forms and manufacturing technology were adopted in the Central Valley is highly suggestive that there was day-to-day interaction possibly via colonists from Tiwanaku.

What was it about Tiwanaku drinking traditions that made local affiliation easy

and rapid? I argue that in addition to the strong symbolic importance of materials related to Tiwanaku and its ideological power, it was both the increased importance of drinking and the inclusiveness of Tiwanaku drinking customs that were appealing, greatly facilitating the integration process. This pattern of Tiwanaku inclusiveness is found at Piñami and is a characteristic of the Tiwanaku state; at the capital, in the greater Lake Titicaca Basin, and at Moquegua, drinking vessels in the Tiwanaku style are common in households and burials in the Middle Horizon, a pattern quite dissimilar to that found in the Wari and Inca empires (Bray 2003; Cook and Glowacki 2003).

The importance of this inclusiveness should not be underestimated. Instead of a practice restricted to the elite or to feasting contexts, the new custom of *chicha* drinking at the household level, using special drinking vessels, had the effect of integrating the local population quickly and effectively into the Tiwanaku sphere. To paraphrase Dietler (1990:378), cultural identity in Cochabamba's Central Valley came to be defined vis-à-vis Tiwanaku society.

In light of Bowser's ethnoarchaeological data from Conombo, we can project how this *chicha* transformation could have taken place household by household. As she has demonstrated, substantial local politics take place at the household level during formal and informal visits and beer is always served during these visits. The bowls used for serving beer contain messages via stylistic elements that signify information imparted to guests about the household's political group, ethnic identification and factional affiliations (Bowser 2000, 2002). Examining the data from Piñami and Quillacollo, we can see that prior to Tiwanaku influence, there was not evidence of regular use at the household level of finely crafted ceramic vessels for *chicha* drinking. During the Middle Horizon,

household level ceramic drinking vessels increased in frequency, suggesting that locals were participating in the new drinking customs, initially using their own style of vessels or imported vessels from Tiwanaku. Almost immediately after the new drinking customs were introduced, CVCT drinking vessels became increasingly common. Thus, contact with colonists or traders from Tiwanaku who brought the tradition with them apparently had a transforming impact, especially in rituals of reciprocal hospitality.

Thus, at the household level, individuals were sending messages to others in their community of their acceptance not only of Tiwanaku drinking practices but also of Tiwanaku ideology and political affiliation. In the game of social competition, Tiwanaku material culture and attendant practices were clearly associated with higher status and social advantage. The result was a rapid change of local identity to one that referenced Tiwanaku definitively. This Tiwanaku identity lasted for hundreds of years.

In sum, Tiwanaku drinking customs promoted social cohesion at the household level, at home, and abroad, using paraphernalia heavily coded with state symbols. So powerful was this tradition that it radically changed Cochabamba, an area with a preexisting *chicha* tradition. Drinking practices and vessels were part of important rituals that alternately served to promote rapid social transformation and to undergird social stability.

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[1] This chapter is based largely on my article, Tiwanaku Influence on Local Drinking Patterns in Cochabamba, Bolivia by Karen Anderson in *Drink, Power, and Society in the Andes*, edited by Justin Jennings and Brenda J. Bowser. Gainesville: University Press of Florida, 2009, pp. 167-199. Material used with permission of the University Press of Florida.

[2] At Tiwanaku, there are vessel forms as well as some motifs that appear mostly in elite contexts, notably the flaring-rim bowl *(escudilla)* and a curved-base *tazón* (Alconini Mujíca 1993; Couture 2002; Couture and Sampeck 2003; Janusek 2002:46). In general,

the vessels found in elite contexts were of higher quality than those found in non-elite residential contexts (Couture 2002; Janusek 2002:43-44).

[3] Burkholder states that at Iwawi small jars with flaring rims *("florero"* forms) were found only in female burials. She suggests that this vessel type could have been used for drinking *chicha* among women (JoEllen Burkholder, personal communication 2008).

[4] Since few whole Late Intermediate Period drinking vessels were found in our Piñami excavations, sizes and volumes are based on measurements taken from the general collection of the Universidad Mayor de San Simón Archaeological Museum in Cochabamba with the kind consent of the museum's director, David Pereira Herrera. The Late Intermediate whole vessels used for comparison were similar to whole vessels and fragments found in excavation in terms of style attributes and rim and base diameters.

[5] This high volume for pitchers is quite distinct from the Middle Horizon, where serving ware pitchers, whether imported Tiwanaku or CVCT, occurred infrequently and had a much lower average volume capacity—typically about a liter, just sufficient to fill a single kero.

Table List for Chapter 5

Figure List for Chapter 5

Chapter 6: Piñami Burial Practices

The honoring of ancestors is central to Andean religion and social identity. Ongoing interactions with the dead are a vital part of the activities of the living. In any society, burials reflect identity, ideology and worldview. They are public events that tend toward conservative traditions and provide opportunities not only to express but also to renegotiate the social order (Goldstein 2005:238-242; Korpisaari 2006). For these reasons, changes in mortuary ritual can indicate social changes or even population replacement. Burials can also reveal the overall physical health of the population, as well as possible signs of stress or interpersonal violence. Further, a crucial advantage of mortuary data is the chance to see individual choice rather than a palimpsest of evidence from many individuals spanning months, years or decades, as is typical for domestic contexts.

In this chapter, I consider Piñami Middle Horizon mortuary evidence with respect to a number of varied topics. For the sake of comparison, I begin with overviews of the traditions of Tiwanaku and its peripheries, as well as those of the Cochabamba Formative and the Cochabamba Middle Horizon. Next, I offer a detailed presentation and analysis of my team's mortuary findings concerning a range of topics: treatment and positioning of the body, social context of burials and orientation, chamber construction, burial offerings, and the population of Piñami in terms of health, age, sex and status.

In the final section of the chapter, I focus on findings that directly address the two principal lines of inquiry of this dissertation: what does the evidence reveal about Cochabamba, about Tiwanaku and about the relationship between the two and how does the evidence help refine Central Valley chronology. This section is divided into three parts. First, I address Tiwanaku influence by examining changes in offerings, body position, and tomb construction techniques that point to the significant influence of Tiwanaku in the Central Valley by the Early Piñami Phase. Second, I review how the mortuary evidence supports my argument for the distinction between Early and Late within the Piñami Phase. Third, using specialized physical bioarchaeological analyses, I address the questions of ethnic identity and place of origin of the burial population. The findings indicate a multi-ethnic population in Piñami, especially in the Early Middle Horizon, and suggest not only the spread of customs but also the movement of people into the Central Valley from highland regions.

Comparative Studies of Burials

Burial Traditions of Tiwanaku and its Peripheries

Korpisaari has done extensive work on burial patterns from Tiwanaku and its peripheries (2006). The following summary is largely drawn from his work. For a more detailed presentation of Tiwanaku burial customs, see Table 6.1 and Korpisaari 2006.

The majority of burials in the highlands were found in clusters near habitation sites or in abandoned domestic areas, but some were found singly in domestic areas under floors, walls or patios (Bermann 1994; Janusek 2004; Korpisaari 2006; Rivera Casanovas 2003). Middle Horizon burials in the Tiwanaku core were commonly in belowground pits or chambers, with construction types including simple pits, cists with stone collars, and fully stone-lined or stone-covered round or rectangular chambers (Bermann 1990, 1994; Burkholder 1997; Janusek 2004; Korpisaari 2006). Stone-lined chamber tombs were common and in many regions were the dominant type (Bermann 1990, 1994; Burkholder 1997; Janusek 2004; Korpisaari 2006). Urn burials were present in the Formative and Middle Horizon in the highlands but were rare (Bermann 1990:94; Korpisaari 2006).

The most common body position in the highlands was a seated flexed position, though on-the-side flexed was also found (Bermann 1990, 1994; Blom and Bandy 1999). Ceramic offerings in highland Tiwanaku tombs were frequent but limited in quantity and usually averaged only one or two ceramic vessels per tomb, typically including at least one decorated Tiwanaku vessel, usually a *kero* or a *tazón* (Korpisaari 2006:157). Other offerings could include beads, camelid bones, baskets, wood or bone items and metal items.

Table 6.1. Summary of Tiwanaku Burial Traditions.
Based on summary of Tiwanaku burial traditions by Korpisaari (2006) and others as noted.

NUMBER OF INDIVIDUALS	The majority of Tiwanaku burials were primary, single individual burials.

BURIAL CONTEXT	The context varied but included burials within or close by domestic spaces or in isolated cemeteries. Clusters of burials were found in abandoned residential contexts or agricultural terraces (Lukurmata, Bermann 1990, 1994; Tiraska, Korpisaari 2003, 2006). In Lukurmata some of these clusters were segregated by body position (Bermann 1994).
TOMB CONSTRUCTION	Tiwanaku used a variety of tomb construction types, including "stone lined and roofed chambers, stone collared tombs with stone covers, stone covers, simple pit burials, shaft and side chamber tombs, sacrificial burials, etc." (Korpisaari 2006:155). Urn burials were present but not common. Regions varied in terms of which construction types predominated, with the greatest diversity found at Tiwanaku itself.
VISIBILITY	Burials are primarily underground but often had covers or markers that were visible at the surface. In Moquegua, where preservation was excellent, Goldstein found wooden marker poles (Goldstein 2005). Only a couple of burials throughout the Tiwanaku hegemony had aboveground structures. One was in Moquegua (Goldstein 2005) and the other was in Lukurmata (Bermann 1990).
BODY POSITION	Almost all individuals were buried in the flexed position, primarily the seated flexed position. The on-the-side flexed position was more common in Lukurmata and the Taraco peninsula than at Tiwanaku, and in some areas such as Moquegua, seated flexed is almost universal. Overall, on-the-side flexed position was less common than the seated flexed position in all areas.
BODY ORIENTATION	There was significant variation in body orientation, though facing east was the most common. However, some cemeteries showed a distinct alternative pattern--e.g., at Tiraska, 77% faced west or south (Korpisaari 2006:158).
OFFERINGS	Ceramics were the dominant offering in Tiwanaku-related burials. The most common number of ceramic offerings was 0, 1 or 2 vessels. Only rare outliers had more than 4. The most common vessel forms used as offerings were *keros*, *tazones* and *vasijas*. Also found are animal bones (primarily camelid) and beads.
AGE AND SEX	The dead of all ages and both sexes received similar burial treatment, although the burial chambers of children were often

	smaller. However, Goldstein (2005:254) noted that there is gender differentiation in terms of offerings at Moquegua: men were associated with *keros* and women with *ollitas*. Burkholder also noted that at Iwawi (JoEllen Burkholder, personal communication 2007) only men were associated with *keros*.
ELITE BURIALS	Overall, there are few truly elite burials found in the Tiwanaku region and the majority of presumably high status tombs at Tiwanaku were looted (Couture 2002; Korpisaari 2006). One high status tomb has been found in Moquegua (Goldstein 2005). This individual had eight ceramic vessels, three tapestry tunics, and 800 stone beads. However, no Tiwanaku burial has been found that rivals the number and type of offering known among the Moche or the Wari (Korpisaari 2006:160-163).
ACCESS TO "ELITE" ARTIFACTS	There were fewer gold and silver artifacts or stone beads in Middle Horizon Tiwanaku tombs than in tombs from the Formative. Korpisaari feels that, at least by Tiwanaku V, there was restricted access to these presumably high status goods.
DEVIANT BURIALS	Only a few face-down burials have been recorded at Tiraska (Korpisaari 2006:159) and Moquegua (Goldstein 2005:258).

Burial Traditions of Formative Cochabamba

In order to assess Tiwanaku influence at Piñami, it is important to review what we know of the pre-existing local burial traditions. Formative evidence from the Central Valley, High Valley and Mizque Valley is set out below. Unfortunately, a lack of burial detail from many sites makes it difficult to say whether particular traditions are widespread.

Formative Cochabamba burials could be located in cemeteries close to habitation sites, singly within or near habitations, or in large middens (Bennett 1936; Döllerer 2013; Gabelmann 2005; Pereira Herrera et al. 1992). Tomb construction types included

shallow depressions, simple pits with fill, simple pits with stone covers, urns, and stone-lined and covered chambers, usually with slabs of stone placed vertically to line the chamber.

Body positions varied and included: face-up, fully extended burials placed in irregular pits, at times covered with slabs (from Sierra Mokho in the Central Valley (Döllerer 2013) and Conchupata in the Mizque Valley (Pereira Herrera et al. 1992, Pereira Herrera et al. 2001)); urn burials with remains placed within a large *olla* or *tinaja*, often with two urns placed on top of each other (Sierra Mokho (Döllerer 2013) and Colcapirhua in the Central Valley (Bennett 1936)); casual burials with the bodies placed in irregular semi-extended position in middens or ash pits (Santa Lucía in the High Valley (Gabelmann 2005)); on-the-side flexed burials (at Sierra Mokho starting in the Early Formative (Döllerer 2013) and one at Santa Lucía from the Middle Formative (Gabelmann 2005)); a few seated-flexed burials, mostly within urns (Sierra Mokho (Döllerer 2013)); and secondary burials (Sierra Mokho (Döllerer 2013)).

Frequency and type of offerings accompanying the deceased varied by time, location and burial method. The offerings for the Early Formative extended burials from Conchupata included large ceramic vessels, agricultural tools such as stone axes, and stone beads (Pereira Herrera et al. 1992). The majority of the Middle Formative burials excavated at Santa Lucía in the High Valley by Gabelmann had no offerings (Gabelmann 2005), whereas the urn burials excavated by Bennett in the High Valley and the Central Valley each had a few ceramic offerings (Bennett 1936). Excavations by Döllerer (2013) at Sierra Mokho show burials from Early, Middle and Late Formative. The offerings for the Early and Middle Formative burials were mostly ceramics but also included artifacts

made of stone, bone, metal and shell. This pattern changed in the Late Formative when offerings consisted primarily of ceramics, a change associated with the introduction of painted ceramic styles such as Tupuraya and Sauces.

Burial Traditions of Middle Horizon Cochabamba

Findings from Middle Horizon sites in the Cochabamba Valleys, along with findings from Piñami prior to 2002, provide a context for assessing the data from my excavations.[1]

Arani, High Valley. The majority of the Middle Horizon burials found by Bennett at Arani, in the High Valley, were pits with stone covers; only one had stone-lined walls and cover (Bennett 1936). Most of the tombs appeared to have bark wrappings. Bennett also found a number of larger ceramic vessels associated with smaller offerings, possibly urn burials. The most typical burial position he mentioned was the flexed position. Burials contained three to five ceramic vessels and typically included a *kero*, a *tazón* and a double-handled plain "bowl", which may be the *ollita* form. A few unusual items were found as offerings; most notable was a copper disk, 8cm by 4cm, with a hole at the top.

Tupuraya, Central Valley. Twenty-seven Middle Horizon burials were excavated by Rydén (1959) at the site of Tupuraya, a mound site located in the northeast of the Central Valley. As with Arani, the site appears to have been an occupation site as well as a cemetery, as there was refuse and ash.

The variety of Middle Horizon burial types found included stone-lined and covered chambers and simple pits with and without stone covers. The simple pits and chambers were all rectangular or oval with the orientation of the length of the chamber

slightly to the east of north. Also present were urn burials placed in a simple pit and occasionally placed in a round stone-lined chamber.

Offerings were primarily ceramic vessels with quantities ranging from 0 to 8 vessels. Three outliers had significantly more: 14, 22 and 26 vessels. The most typical vessel forms were drinking vessels (*keros* and *vasos embudos*), *vasijas*, *tazones* and *ollitas*. Based on Rydén's drawings, the vessel styles were most commonly Tiwanaku but also included Sauces, Omereque and Cochapampa. Non-ceramic grave offerings were rare. Of the three tombs that had unusually high numbers of offerings and possibly represented higher status individuals, two were placed in stone-lined and covered chambers while the third, the one with the most offerings, was placed in a simple pit.

Piñami 1988. Piñami was excavated in 1988 by Ricardo Céspedes Paz (1998, 2000). Céspedes Paz found numerous Middle Horizon burials and generally considered Piñami a cemetery mound. As mentioned in Chapter 3, Céspedes Paz was the one to separate the Middle Horizon into the Illataco and Piñami phases based in large part on these excavations. He notes for his phase distinctions that the earlier burials had imported Tiwanaku alongside local style ceramics. He does not mention much detail on tomb construction, but he does mention the presence of small buildings made of yellow adobe that he considers burial mausoleums.

Piñami Burial Evidence

Our Piñami excavations yielded a wealth of data with respect to mortuary evidence. In total we recorded 60 funerary contexts (CF, *contexto funerario*). These vary in the amount of detail we have due to the state of preservation of each tomb and its human remains.[2] A number of these burials offer so little information that I did not use them for any statistical comparisons; others offered information on one topic but not on another, so the number of total burials cited in any particular comparison may differ from what is used in another comparison. A detailed description of each funerary context (CF), including burial context, body position, orientation, burial type, offerings, completeness, skeletal remains and photos, is found in Appendix 2. Below is a summary and synthesis of the burial data by topic: social contexts of the burials, treatment and positioning of the body of the deceased, construction and orientation of burial chambers, burial offerings, and the individual deceased – their health, age, sex and status.

In Chapter 3, I made the case based on ceramic evidence that the Piñami Phase should be subdivided into Early Piñami and Late Piñami. The following discussion further supports a subdivision between Early and Late Piñami Phases. The Piñami burials were found in two major temporal clusters that were separated with a gap of at least 1 meter between them. Temporally, the two clusters correspond closely to the Early Piñami Phase and Late Piñami Phase. The later cluster of burials comes from Late Piñami Phase contexts. A few burials in the earlier cluster, however, *may* have come from late Illataco Phase contexts rather than Early Piñami Phase contexts; it was impossible to be certain due to PLANE excavation techniques. For this reason and to allow for that possibility, I have chosen to use the terms "Early Group" and "Late Group" burials instead of Early Piñami and Late Piñami burials.

Social Contexts of the Burials

Almost all of the Piñami burials are single-person burials. There is one clear case with two people in a tomb and two other cases that *possibly* represent more than one individual. For all burials where social context could be determined or surmised, the burials were found in at least two social contexts. Most burials were placed in a cemetery, i.e., a cluster of burials placed close together in a confined space in roughly the same stratigraphic levels. We also have two examples of burials placed within domestic areas still in use: one was found under a room floor (CF-25) and the second under a patio area (CF-32).

Cemeteries. We recorded two clusters of burials, interpreted to be cemeteries, one from Illataco/Early Piñami Phase contexts and one from Late Piñami Phase contexts.[3] In both cases, the cemeteries were placed in areas of the site that had been previously used for domestic functions and eventually returned to domestic functions.

The later cemetery cluster dates from the middle to the end of the Late Piñami Phase. These burials (CF-28, -29, -30, -31 and -33) were all found within a 2 meter by 4 meter area, though the full horizontal extent of the cemetery is unknown due to prior excavations and site destruction (Figure 6.1). What remained of the cemetery revealed burials that were quite densely packed, with some burials overlapping and cutting into earlier ones. Prior to its use as a cemetery, the area was domestic space, as the burials cut into domestic floors, hearths, storage/garbage pits, etc. At some point in the Late Middle Horizon, the cemetery area apparently transitioned back to use as domestic space since

we found remains of Middle Horizon floors above the cemetery cluster. The full context is unknown, however, as this area was cut into by a large borrow/refuse pit from the subsequent Late Intermediate Period.

In the case of the earlier cemetery (from the Illataco/Early Piñami Phase), we can see the full horizontal extent, 10 by 12 meters, with the majority of the burials found in Sector A and the remainder found in Sector B (Figure 6.2). There are a few cases where it looks like a later burial cut into an earlier one, but in general the burials were spread out in the cemetery. As with the Late Piñami cemetery, the earlier cemetery cut into contexts that were previously domestic, including hearths, refuse pits and walls. The vertical depth occupied by these burials is ~1 meter (PLANE Levels 15 to 20). PLANE reported there were very few burials found prior to Level 15.

Visibility of Burials in Cemeteries. Burial markers have been noted in some areas of the Tiwanaku hegemony that have particularly good preservation, such as at Moquegua. There, Tiwanaku burials had markers that made them visible at the surface. Wooden poles or canes were the most common type of markers but above ground stone collars were also used (Goldstein 2005:246). For Piñami, while we do not have preservation of any wood or cane markers, we do have evidence that at least some of the tombs in the cemetery clusters would have been visible after burial. In some cases, a stone or clay tomb cover would have been visible above the surface of the ground. In addition, we have a couple of pit burials where a single non-structural oblong stone was placed vertically so that its upper portion would have been visible. For example, CF-39a had an oblong stone 50 cm or more in length that was placed vertically above the body in the middle of the pit with the majority of the rock buried in the fill of the pit, leaving

approximately 20 cm protruding as a visible marker (Figure 6.3). CF-18 and CF-65 may have used the same method. A couple of the urn burials may have been visible at the surface as well. The visibility of tombs in the cemetery clusters distinguishes them from burials inside living spaces. The burials found below floors or patios were not marked at the surface but instead were leveled and sealed.

Burials within Domestic Space. We have two examples of burials that are clearly found within domestic space. The first, CF-32, was a burial of an adult woman placed in an oval pit within a patio area (see CF-32, Appendix 2 for details). The patio area continued in use, as evidenced by the fact that the patio was patched and repaved a number of times. CF-25 was a child burial placed below the floor of a room of Structure 1 with some fill placed on top before the floor was installed (see CF-25, Appendix 2). This burial is associated with a probable ceremonial room, as will be discussed in Chapter 7.

Burial Types and Positioning of the Body

I separate the Piñami burials into three key types – urn, secondary and flexed position burials. I further separate flexed position burials into seated flexed and on-the-side flexed (with one anomalous semi-flexed burial). Where there are temporal distinctions, I designate the burials as either Early Group or Late Group as defined above.

Urn Burials. Urn burials are a local mortuary tradition dating to the Early Formative in the Cochabamba valleys (Bennett 1936; Döllerer 2013) and common during the Formative in the tropical regions further to the east (Brockington et al. 1995). While

a few urn burials have been found in the highlands, they are *not* a common tradition around Tiwanaku (Korpisaari 2006). At Piñami we recorded four urn burials from Middle Horizon contexts: three from the Early Group (Figure 6.4) and one from the Late Group. Together these comprise about 10% of Early Group burials and 8% of Late Group burials.[4]

Early Group Urn Burials. Early Group urn burials (CF-2, CF-5 and CF-65) clearly correspond to the Early Piñami Phase rather than the earlier Illataco Phase, an unexpected finding given that urn burials were more common in the Formative than in the Middle Horizon. Further, the urn burials were very clearly contemporaneous and intermixed with other burial types comprising the Early Group cemetery cluster.

Two of the Early Group urn burials used a single large vessel, either an *olla* or a *tinaja,* and one used two *ollas,* one on top of the other, with the human remains in the bottom vessel. These urns were all previously broken and were placed with the broken side up, either upside down or right-side up. In one instance, rocks were placed over the top opening. The *ollas* and *tinajas* were in local styles, except in the case of CF-5 where the upper *olla* (of the double *olla* burial) was clearly imported from the highlands, as the temper included large amounts of sand and mica, diagnostic of the Tiwanaku area (Janusek 2003b:58). All reported associated fineware offerings were of local styles Sauces and Cochapampa. (At least one or two other offerings seem to have been lost by PLANE before we could record them; see Appendix 2.) Human remains were retained from two of the three Early Group urn burials. Preservation was extremely poor, so the age of the deceased was determined solely on the basis of teeth. In both cases, the urns contained a child or an infant.

Late Group Urn Burial. Only one urn burial was found in the Late Group. This burial, CF-43, was located close to a Sector C Late Piñami Phase domestic structure and may have been placed under a floor or patio area. The urn, a *tinaja*, was clearly imported from the Tiwanaku region as it had non-local paste and temper and it was overly hard for a Cochabamba *tinaja*. It also had a combed surface and a distinctive cream-colored slip considered characteristic of highland *tinaja*s (Janusek 2003b:59; Riveras Casanovas 1994). The *tinaja* contained the remains of an infant and offerings of a CVCT *kero*, a small *tazón* of unknown style, an *ollita* encrusted with carbon, a small unpainted utilitarian *vasija* and an unfired pinchpot. Interestingly, this burial contained the most offering vessels of any of the Late Group burials and was the only one that had imported ceramic vessels.

Urn Burial Observations. Despite the variability, we can see some general patterns in the urn burials. All known instances contained children, possibly indicating a change from the Formative when all age groups were found in urn burials. The urns were either *tinaja*s or *ollas*, and the vessels were typical in shape and paste to ones found in domestic contexts. All had either a broken base or rim, and the *ollas* had encrusted carbon on their surfaces, indicating they had previously been used for cooking.

Offerings were temporally distinct. In the Early Group, the painted ceramic offerings were only in local styles, whereas by the Late Group the offerings were all CVCT and foreign styles. Overall, urn burials appear to be a continuation of a local Formative burial tradition. However, by the Late Piñami Phase, even though the general method remained the same, Tiwanaku style offerings were dominant.

Secondary Burials. Secondary burials are not much reported in the Cochabamba region. At Piñami, we had one complete secondary burial (CF-9) (Figure 6.5) and one partially disturbed secondary burial (CF-13). Both are from the Early Group and both were adults placed in shallow pits and accompanied by ceramic offerings of local and Tiwanaku associated styles. In both cases, the long bones were placed parallel to each other, oriented north to south or slightly northeast/southwest. The cranium of CF-9 was positioned to the south of the long bones; it was on its left side and faced north. CF-13 was missing its cranium.

Flexed Position Burials. Flexed position burials were by far the most common type at Piñami, accounting for 31 out of 37 burials. All of the flexed burials where body position could be determined were primary interments with the body placed with the knees up tightly to the chest and, most commonly, the flexed arms placed between the chest and the flexed legs. Flexed burials came in two sub-types, one with flexed bodies placed in a seated position and the other with flexed bodies placed in an on-the-side position.

The placement of the body is correlated with the overall tomb form, as seated flexed bodies were always found in round pits or tombs and on-the-side flexed bodies were always found in oval or rectangular pits or tombs. This pattern was consistent for all burials where body position could be determined, so I extrapolate the original body position from the chamber form in cases where the remains were disturbed or preservation was so poor that body position could not be determined directly.

Chamber Construction, Body Wrappings and Organic Fill

Among the many important variables of burial traditions are chamber construction technology and methods, type of body wrappings and type of organic fill.

Chamber Construction. The Piñami site revealed a large variety of burial chamber methods from simple to complex and labor intensive. Despite the variety in construction type, however, the overall dimensions of the chambers were fairly consistent and each value was within a 10 cm range +/- from the average. The average for round pits or tombs was 60 cm in diameter and 80 cm in depth. The chambers for rectangular or oval burials were typically 90 cm to 100 cm in length by 50 cm wide and 50 cm to 60 cm deep. A few chambers are exceptions to these general rules; they were significantly smaller and contained the remains of children or infants.

I have separated chamber construction into seven basic types with further subdivisions for the more complex methods.

Structure Type 1: Irregular Pits with Fill. These are simple irregular pits with no cover stone or obvious surface marker (Figure 6.6). Simple pits were used for both round and oval burials, with oval burial pits usually no more than 50 cm in depth and round burial pits up to 70 cm in depth. The pits varied in shape. Some were concave depressions, wider at the opening than at the base, and some were slightly bell-shaped, wider at the base than at the opening. Once the body was in place, the burial was filled in with dirt and sometimes lumps of clay. This method was present in both Early Group and Late Group burials.

Structure Type 2: Vertical Walled Pits Without Cover Stones. These are cut walled chambers with no cover stone or marker (Figure 6.7). This structure was more

formal in that the pits were very regular in form, either round or oval, and had deliberately cut vertical walls, usually 50 to 60 cm in depth. The base of these chambers was at times smoothed with a layer of clay or a single flat flagstone. Once the body was in place, the pit was filled in with dirt and sometimes sealed with a layer of clay. This method was used in both Early and Late Group burials.

Structure Type 3: Stone Cover Over Simple or Cut Pits. The distinguishing characteristic of Structure Type 3 is the presence of cover stones placed over irregular or vertical walled pits (Figure 6.8). Large stone slabs formed the covers that crossed the tomb opening, with remaining openings filled in with chinking stones. In some instances, the pit was filled in with dirt so that the stones lay atop fill, whereas in other instances, the stones lay across an open space. Stone covers, on fill and over open pits, were used for both oval and round burials. In the case of oval pits, in all instances the large stones were placed parallel across the width of the pit. For round chambers, we have two cover techniques: one with stone slabs placed parallel to each other and a more complex form where concentric rings of stones formed a low cone over the burial (see CF-39a, Appendix 2**).** Stone covers are only present in Early Group burials.

Structure Type 4: Rim Stones and Stone Cover. A more formal method of construction includes a ring of stones around the rim of the burial chamber, providing a strong base for cover stones (Figure 6.9). This collar of stones occurred around both round and rectangular cists. Stone rim and cover stone burials are only present in Early Group burials.

Structure Type 5: Stone-Lined and Roofed Chambers. The most complex stone tombs were lined, roofed and occasionally floored with stone slabs. This structure type

occurred in both rectangular and round varieties (Figure 6.10). Type 5 tombs were only present in Early Group burials.

-- *Chamber Construction for Rectangular Stone-Lined Tombs.* Rectangular stone-lined tombs had interior space of 90 cm to 100 cm in length by 50 cm to 60 cm in width and 50 cm deep. The bases could be formed in a variety of ways: with compacted dirt, a layer of clay, or flagstones. In the case of flagstones, there might be only one or two stones or there might be full coverage of the base (Figure 6.11). The interior walls were formed by pressing courses of oblong stones into the mud walls of the chamber. The stones were positioned horizontally with the flattest surface placed facing the tomb's interior to give the chamber roughly straight-sided walls (Figure 6.12). Mud mortar was placed between the courses of rocks to help support the next course. There was some variety in the composition of the courses. In two burials, CF-3 and CF-36, the interior façade was a combination of stone and clay/adobe; the walls were comprised of a course of stones at the base of the tomb, then mud and clay where the second course of stones would normally be, and then a course of stones along the rim.

-- *Chamber Construction for Round Tombs.* We have one only example of a round stone-lined tomb (CF-53). The dimensions of the tomb were 75 cm in diameter by 70 cm in depth. In this tomb, the chamber had flat-sided stone slabs, placed vertically to line one half of the tomb wall. The remaining half was formed by three courses of smaller flat-sided stones, roughly square in shape, with the flat sides outward (Figure 6.13). A small round flagstone was placed at the base of the chamber.

Structure Type 6: Adobe/Clay-Lined and Covered Chamber. We have one example of a fully-lined rectangular chamber that lined the walls with yellow or whitish

adobe bricks or blocks of clay instead of stones (see CF-31, Appendix 2). The blocks were placed against the walls to form a flat façade on the interior of the tomb, with layers of blocks set in place using darker-colored mud mortar (Figure 6.14). After placement of the body and offerings, the tomb was filled in with dirt and large lumps of yellow clay and topped at the surface by additional blocks of clay. Structure Type 6 is only recorded for the Late Group burials but may have begun earlier.

Structure Type 7: Free-Standing Adobe/Clay Walls. One burial (CF-28) broke away from the concept of rock or adobe/clay façade for the burial chamber and instead was comprised of free-standing adobe walls set within a larger pit (Figure 6.15). The technique used to form this burial started with the excavation of a large rectangular pit (1.3 m by 1.1 m), then a layer of clay was used to create a smooth yellow floor, and then the rectangular structure was built inside the larger pit on top of the prepared floor. This free-standing structure had approximately 20 cm wide walls and the chamber had interior dimensions following the norm, approximately 90 cm in length by approximately 50 cm to 55 cm in width. Loose fill was placed between the exterior of the clay structure and the walls of the original pit. After burial, the adobe chamber was filled in with dirt and irregular blocks of yellow clay and capped by stacked clay blocks that covered both the small rectangular chamber and the outer pit outline. The erosion visible on the stacked clay cover showed clearly that it had been exposed to the elements but at the same time made it impossible to assess the initial pattern of the block placement.

Céspedes Paz mentions having found in his 1988 Piñami excavations small Piñami Phase constructions of adobe that he felt were similar to "*chullpas*" found in the highlands (Céspedes Paz 2000:4). *Chullpas* are characterized as free-standing

aboveground burial towers, common in the Late Intermediate in the Andes. It is likely that this Late Piñami Phase burial with its free-standing walls is similar to what Céspedes Paz was referring to and certainly could have been an early proto-type for the Late Intermediate burial tower. However, due to the careful stratigraphic excavation techniques that my team used, we could see that the entirety of the walls of this burial were belowground, though, as mentioned, the cover clay blocks were clearly exposed on the surface.

-- *Roof Construction for Stone Tombs.* The roofs of stone-lined tombs varied in design. The simplest type involved laying three to four large oblong slabs across the width of the tomb (Figure 6.16a). This method was employed for both round and rectangular/oval tombs. A more complex roof for rectangular tombs involved covering half of the tomb with large slabs laid flat across the width as usual. The second half was covered by slabs placed on a tilt with one end resting on the tomb rim and the other resting on the horizontal slabs. This provided a tent-like roof and increased the height of the tomb cover substantially (Figure 6.16b). A third method used shorter stones to form a rough corbel vault roof structure with up to three tiers of stones braced on the underlying stones (Figure 6.16c). This method was more often used to roof round chambers (see for example CF-54, Appendix 2) but was also used in one rectangular tomb (see CF-3, Appendix 2). For all stone roof structure types, any small openings not covered by the large slabs were filled in with small chinking stones.

Body Wrappings and Organic Fill in Burial. Clear evidence for textiles, body wrappings and other organic fill is limited due to poor preservation. However, most of

the non-urn burials do have evidence of fine white powder, white fibrous material or other plant material (Figure 6.17).

White powdery material was typically found around the skeletal remains, at times in a circular pattern (see CF-26). The powder was so fine that it was impossible for us to determine its original composition. Based on the proximity to the skeletal remains and frequent circular outline, however, it is likely this powder is the remains of textiles that covered the body.

White fibers that appear to be remains of grasses were also frequently found around the bones and offerings. In some instances, the remains of the fibers were patterned (Figure 6.18) and could have been remains of ropes, basketry or mats used to cover the body.[5] In other instances, the plant fibers were randomly arranged, at times densely packed, appearing to be fill. The best evidence of grass fibers is from CF-27, a stone-lined and covered rectangular tomb where the preservation of plant remains was particularly good. There we found remains of short grasses densely packed around the majority of the offering vessels (Figure 6.19).

In addition to textiles and fibers, tree bark was also used in burials. The bark was dark brown and papery in appearance. Seven burials contained remains of tree bark (CF-1, -3, -17 -19, -26, -29, and -36). In three cases, the bark seemed to be part of tomb preparation, with bark found under and around the body. The burials with bark come from on-the-side flexed, seated flexed and secondary burials and were found in both the Early Group and the Late Group. The best evidence for bark used in a burial comes from CF-36, a stone-lined and covered tomb. In this tomb, layers of papery bark were

wrapped around the entire funerary bundle underneath and above the body, enveloping many of the offerings with the body (Figure 6.20).

The papery bark likely comes from a species of the *Polylepis* tree—a high altitude tree that typically grows at elevations of 3200 to 4500 meters above sea level (Terceros Cespedes 2007). *Polylepis* species generally do not grow in valley flatland areas even at higher elevations, preferring sloping and rocky soils (Kessler 1995), so *polylepis* would have been available but not immediately accessible. Bark has also been noted for highland burials on the Taraco peninsula by Bennett (Bennett 1934) and Blom and Bandy (1999) and was present in the majority of the Middle Horizon burials from the Cochabamba High Valley site of Arani (Bennett 1936).

In sum, while no technical analysis of these powder, fiber and bark remains has been done, the mortuary ritual for the deceased appears to have included clothing and various wrappings. Given the circular arrangement of the white powder and patterned fibers around the body, the body was likely wrapped in textiles, forming a bundle. The evidence from the remains of plant fibers suggests that in some instances the body bundle was also wrapped in a woven mat or basketry. Bark sheets appear to have been used at times as additional wrapping and grass may also have been added as fill or cushioning for the body and offerings. There is no notable difference in the presence of powder, fiber or bark remains between the Early Group and Late Group.

Orientation of Burial Chambers and Individuals

Patterned orientation of the body or burial chamber can be important elements of mortuary ritual. If we look at the orientation of the axis of symmetry of the burial chamber itself--only a factor in rectangular/oval burials--there is a very consistent orientation found throughout the Middle Horizon. Beginning with the earliest Middle Horizon burials, all but one of the oval or rectangular burials were oriented so that the long axis of the burial was slightly east of north (Figure 6.21). This is the same alignment used in all the Middle Horizon domestic architecture at Piñami and typically used in Tiwanaku domestic architecture (Janusek 2004), as will be discussed in the following chapter. In fact, the only burial that does not follow this orientation is CF-25. As noted elsewhere, CF-25 was deviant in other ways as well. It was the only body facing down and the only one not in a fully flexed position, as arms were extended at the side and the legs were bent up back at the knees. It was aligned perpendicularly to the standard orientation, so the alignment may be purposeful and symbolic. (CF-25 is likely associated with a ceremonial room, as noted above and as discussed in Chapter 7. See Appendix 2). With the single exception of CF-25, this markedly consistent east of north orientation used over hundreds of years indicates a longstanding mental map for the inhabitants of Piñami.

Body orientation was less consistently patterned than tomb orientation. For the 28 burials where body orientation could be determined, 16 faced west/northwest (57%), 8 faced east/southeast (28.5%), 1 faced north (3.5%,) 1 south (3.5%), 1 up (3.5%) and 1 down (3.5%). There is no significant difference in body orientation between the on-the-side and seated flexed burial traditions (west was most common in both), and temporally the moderate dominance of facing west is found throughout the Middle Horizon at

Piñami. While east is the most common orientation at Tiwanaku and its peripheries, other orientations are also used. For example, Korpisaari notes that in 76.9% of the cases at Tiraska where body orientation could be determined, the bodies faced south or west (Korpisaari 2006:158).[6]

Burial Offerings

The Piñami burials included a variety of types of offerings: decorated and utilitarian ceramics, unfired clay vessels, rustic unfired pinchpots, stone beads, carved bone, unworked camelid bones, metal plaques and basketry. Notably absent are any tools related to agriculture, weaving, fishing or other activity that had been present as offerings in some Cochabamba Formative sites like Conchupata (Periera Herrera et al. 1992).

The frequency of offering types at Piñami varied considerably. Fineware ceramic vessels and small utilitarian vessels were by far the most common offerings and were found in almost all burials that had offerings. Unfired pinchpots were also relatively common. Unworked camelid bones were associated with five burials. Four burials contained basketry remains, though due to poor preservation, basketry is likely underrepresented. One burial had a scraper bone that may have been an offering. Other items such as beads, metal disks and carved bone were only found in two higher-status burials.

Ceramic Offerings. In the Early Group burials, the quantity of ceramic offerings ranged from 0 to 12 vessels per burial. The most common vessel types were servingware forms including, *kero*s, *vasos embudos*, *vasija*s, *jarrita*s, *tazones* and ritual vessels. Also

common were small undecorated utilitarian vessels, particularly double-handled *ollitas* and single or no handle *vasija*s.

There was a marked reduction in the quantity of offerings over time. Comparing the number of vessels placed in tombs that had a least one vessel,[7] the Early Group averaged 4.4 ceramic offerings with 12 vessels maximum per burial. This quantity of vessels is higher than found in Tiwanaku areas, which typically average less than two vessels (Korpisaari 2006:157). In the Late Group, the range was 0 to 4 vessels with an average of 2.7 vessels per burial for those that contained offerings and 1.3 vessels per burial of burials overall. The quantity of offerings accompanying Late Group burials fits the pattern found in the Tiwanaku heartland described by Korpisaari (2006).

There was also a big reduction over time in the *variety* of vessel forms used as offerings. In the Early Group burials, we found a full complement of vessel forms, including *kero*s, *vasos embudos*, *tazones*, *vasija*s, *jarras*, *incensarios*, *sahumadores*, effigy vessels and other ritual vessels, as well as small utilitarian *ollitas and vasijas*. In the Late Group burials, the offerings consisted of only four vessel types: decorated *kero*s and *tazones* and undecorated *vasija*s and *ollita*s. In addition to the reduction in variety of vessels we also see a reduction in total decorated ceramic offerings as compared with undecorated vessels. In the Early Group burials, 80% of the ceramic vessels were decorated. In the Late Group burials, only 50% of the vessels were decorated.

Style variety in decorated ceramic offerings was quite high in the Early Group and much more homogeneous in the Late Group. In the Early burials, offerings included a wide variety of ceramic styles, including both local styles (Sauces, Cochapampa, Omereque, Caraparial, Mojocoya, and Monochrome)[8] and Tiwanaku styles (Imported

Tiwanaku Redware, Imported Tiwanaku Blackware and CVCT) (Table 6.2). By the Late Group, all decorated ceramics were CVCT, aside from one vessel of undetermined style. This transition from a wide variety of styles to almost entirely CVCT closely mirrors the transition found in domestic fineware, as discussed in Chapter 4. However, the transition occurred earlier in domestic contexts than in mortuary contexts. CVCT fineware was dominant in domestic contexts by the beginning of the Early Piñami Phase, whereas CVCT dominance in burials did not occur until the beginning of the Late Piñami Phase.

Table 6.2. Differences in Ceramic Styles between Early Group and Late Group Mortuary Offerings.
Note the greater variety of styles in the Early Group than in the Late Group.

	Early Group Offering Styles	Late Group Offering Styles
Imported Tiwanaku Redware	X	
Imported Tiwanaku Blackware	X	
CVCT	X	X
Cochapampa	X	
Sauces	X	
Omereque	X	
Caraparial	X	
Mojocoya	X	
Other or undetermined styles	X	X

Fully 40% of the Early Group gravelots included a mix of local and Tiwanaku (imported or CVCT) style offerings, 32% had *only* Tiwanaku offerings and 28% had exclusively local style offerings. By the Late Group, *all* decorated ceramics were CVCT, aside from one eroded vessel of undetermined style.

Imported Tiwanaku Vessels. The quantity and accessibility of *imported* Tiwanaku vessels in the Early Group is notable. Under a prestige goods model, imported decorated

vessels would be expected to be restricted to higher status burials and infrequent in non-elite burials, especially those vessels that were made by specialists. At Piñami, of the 104 offering vessels in the Early Group, 15 vessels were clearly Tiwanaku imports based on paste, temper and pigments, and another 6 were *likely* Tiwanaku imports. These 21 vessels were not limited to a few "wealthy" burials, but instead were spread out among 13 burials so that 52% of the 25 Early Group burials had at least one imported or likely imported vessel. In addition, there is no indication of restriction based on age, sex or tomb type. The 13 burials with imported Tiwanaku ceramics included children through adults, both males and females, pit burials through stone-lined tombs, both round and rectangular variants, and flexed and secondary burials. (Urns were the only tomb type apparently without imported decorated Tiwanaku servingware, though one Early Group urn burial included a highland *olla*.) In contrast to the Early Group burials, there were *no* imported Tiwanaku fineware vessels in any of the Late Group burials (though the single Late Group urn was itself a highland *tinaja*).

Tomb Type and Offerings. I found no clear correlation between tomb type and the quantity of offerings in the Late Group burials, but there was a notable pattern in the frequency of offerings between tomb types in the Early Group (Figure 6.22). In the Early Group, urn burials had few offerings: only 1 to 2 vessels each (in addition to the ceramic container[s]). For the flexed burials in the Early Group, seated flexed/round burials had notably fewer offerings (averaging 2.8 vessels per burial; range 0 to 4 vessels) than on-the-side flexed/rectangular or oval burials (averaging 6.7 vessels, over twice as many as seated flexed/round; range 4 to 12). Leaving aside the outliers, the two burials that have substantially more vessels (12 offerings each) and may represent higher status

individuals, the average number of offerings for Early Group on-the-side flexed burials was 5.6 vessels (range 4 to 8), still double that of the seated flexed burials. This difference in total offerings between the two burial positions is consistent across other variables such as age or sex of the individual, as will be discussed below.

Tomb construction method (a possible indicator of wealth or status when a particular method requires more intensive labor or higher cost materials) appears to vary with the number of offerings for seated flexed individuals but not as clearly in the case of on-the-side individuals (Table 6.3). For round burials, tombs requiring more effort contained more offerings: stone rim and cover tombs average 3.5 offerings, cut tombs with no stones average 1.5 offerings and irregular pit tombs average 1 offering. We see a similar correlation to a limited extent in on-the-side flexed burials: stone-lined and covered tombs average 8.4 offerings and stone rim and cover tombs average 4.5 offerings. Surprisingly, simple pits had numerous offerings, averaging 5.75 vessels.

Table 6.3. Comparison by Tomb Type of Quantity of Offerings for Flexed Position Burials for the Early Group.

Flexed Position Early Group Offerings	**Stone-lined and Stone Cover**	**Stone Rim and/or Stone Cover**	**Cut Tomb**	**Irregular Pit**
Early seated flexed Range 0 to 4 offerings average = 2.8	No info -- The sole example was looted (n=1).	3 to 4 offerings av. 3.5 (n=7)	1 to 2 offerings av. 1.5 (n=2)	0 to 2 offerings av. 1 (n=3)

Early on-the-side flexed **Range 4 to 12 offerings** **average = 6.7**	5 to 12 offerings av. 8.4 (n=5) *(range w/o outliers: 5 to 8 offerings* *av. 6 (n=3))*	4 to 5 offerings av. 4.5 (n=2)	No examples	4 to 8 offerings av. 5.75 (n=5)

For Late Group burials we did not see correlations between tomb type and offerings as we did in the Early Group. The sole urn burial had five offering vessels, the most of any Late Group burial. The two seated flexed burials and five of the on-the-side flexed burials had no offerings. Two on-the-side flexed burials had only one offering each; three others had three offerings each, but one of those tomb types represented the most effort (free-standing adobe walled structure) and one represented the least effort (simple pit burial). This low frequency of offerings in the Late Group burials is more in line with typical Tiwanaku burials at the capital and peripheries (0 to 2 vessels per burial) (Korpisaari 2006:157) than it is with Piñami's Early Group burials.

Overall, high tomb construction effort does correlate to a limited extent with the quantity of offerings in the Early Group but not in the Late Group. The biggest indicator of quantity of offerings in the Early Group is body position, with on-the-side flexed burials having decidedly more offerings than any other type. The social implications of this disparity will be addressed in more detail in the discussion section below.

Other Offerings

Unfired Clay: Pinchpots, Fully Formed Vessels and Miniatures. Unfired clay pinchpots, vessels or miniatures were found in about half of the burials. Pinchpots,

typically simple rustic irregular vessels, were the most common unfired vessel and varied in form, including single whole pinchpots, double-hole pinchpots and flat slabs (Figure 6.23). A few burials contained fully formed unpainted and unfired servingware vessels. Lumps of unformed clay differing in color and texture from the surrounding dirt were found in some burials. It is possible that unfired clay forms were damaged by moisture, resulting in these clay lumps.

CF-10a was unique.[9] It included a set of seven unfired miniature vessels along with three full-size fired and decorated vessels. The tiny vessels (ranging in height from 2.5 to 6 cm) were smaller versions of a *tazón*, a tetrapod *tazón*, a *vasija*, a *vaso embudo*, an *incensario* (complete with incised eyes and mouth), and either two *ollas* or an *olla* and a *tinaja* (Figure 6.24). CF-10a also included an imported Tiwanaku *kero* and a CVCT *kero*, alongside a Sauces style *tazón*. The miniatures were placed inside the *tazón*. Notable for its inclusion in the set is a tetrapod *tazón*, a form that was characteristic of the Cochabamba Late Formative and practically unknown in the Middle Horizon in either local or Tiwanaku styles. Also notable is the inclusion in the miniature set of a clearly Tiwanaku ritual form, the *incensario*. Notable for its absence from the miniature set is the *kero* form; instead, the drinking vessel is the local *vaso embudo* form.

Baskets. We have only four burials that have evidence of basketry as offerings (CF-3, -27, -28 and -36). CF-27 contained the remains of a fine weave circular basket (Figure 6.18), whereas the others had the remains of broader weave baskets or flat mats. It is likely that baskets and mats were more common as burial offerings than the remains suggest, but preservation of plant remains is poor.

Camelids. Unworked camelid bones were associated with at least five of the burials (Table 6.4).[10] Of the five, four were from Early Group burials and one was from a Late Group burial. The camelid offerings were present in both on-the-side and seated flexed burials. Aside from one rib bone and one leg bone, all were from either the feet or the head of the animal. The camelid phalanges were all found in anatomically correct positions, indicating whole camelid feet were placed in the tomb.

Table 6.4. Burials with Associated Unworked Camelid Bones.

CF Number	**Burial Group**	**Position of Deceased**	**Camelid Offering Parts**	**Context of Camelid Parts**
CF-3	Early	on-the-side flexed	cranium and four feet	above the tomb roof, spaced around the roof
CF-21	Early	seated flexed	cranium and four feet	in burial pit, spaced around the body
CF-24a	Early	on-the-side flexed	lower jaw and long bone	on fill at the top of the burial pit
CF-36	Early	on-the-side flexed	four feet	around the tomb entrance
CF-31	Late	on-the-side flexed	lower jaw and rib bone	in a small pit made below the tomb floor

Worked camelid bone was present in only two burials. One burial contained a piece of bone that was worked into the shape of a triangle and was possibly an ornament (CF-36) (Figure 6.25). The other burial contained a piece of bone, possibly a broken scraper (CF-25), though it is not clear that this bone was intentionally placed as an offering.

Beads. Stone bead offerings were found in two burials, CF-27 and CF-36, which were the two with the most ceramic vessels (12 each) and may have had connotations of higher status. Both had strings of small, green, likely malachite beads (Figure 6.26),

though CF-36 also included some red beads. CF-27 had 101 beads and CF-36 had 123. We do not have the full context for the beads in CF-27, but in CF-36 the beads were laid out in a row near the neck of the body, likely originally placed on a string that did not preserve. The position of the beads suggests they were on the outside of the bundle rather than on the body itself. In addition, in CF-36 we found a large blue sodalite bead and half of a large malachite bead that was cylindrical and bisected.

A secondary burial, CF-9, did contain a small, thin, white shell bead, but the bead was found in the packed clay surface under the body and it is unclear whether it was directly related to the burial (Figure 6.27). Shell of any sort is extremely rare during the Middle Horizon at Piñami.

Metal. Metal objects were only found in one burial, CF-36, one of the two likely higher-status burials. The three metal objects in CF-36 consisted of two silver ornaments and one copper ornament. All appear to be thin plaques, but the copper one and one of the silver ones were so crumpled that the original form could not be determined. The other silver plaque was in good condition. It is in the form of a cross and was placed in the chest area of the body on top of the bundle but below the bark wrappings. This silver plaque has one hole in each of the two "arms" and two holes at the top, likely for sewing it onto fabric. The plaque was lightly incised with a highly stylized figure that may have represented a bird with wings outspread (Figure 6.28).

Food. Only one burial, CF-24b, had a vessel with associated food remains. All other vessels excavated showed no food remains; either they were originally empty or the food in them had completely decayed. CF-24b was an infant burial and had two offering vessels, both of them non-Tiwanaku style *jarras*. The food was placed inside one of the

jarras, which was intentionally sealed with a thick cap of red clay (Figure 6.29). The material inside included a few bones of a whole gamut of animals, including fish, birds, and rodents, and a small camelid bone, possibly the remains of a meat stew. Interestingly, the buried infant was probably too young to eat much meat (though possibly able to eat a meat stew). Temporally, this burial was part of the Early Group, dating from as early as the Illataco Phase. The offering *jarra* containing food remains is itself unusual. This *jarra* is of an undetermined style and has the imprint of a circular mat on its base, the result of a production technique where the vessel is formed on a woven mat, which leaves an imprint. These types of imprints are rare in the Central Valley but are associated with vessels from the tropical regions to the east of the Cochabamba valleys (Donald Brockington, personal communication 1994). The style of the vessel, the placing of the food in a sealed container and the production technique may reflect lowland traditions.

Incense/burning rituals. In three burials (CF-11, -27 and -29), it was clear that burned material was part of the mortuary ritual (Figure 6.30). An imported Tiwanaku llama *incensario* (CF-11), a Tiwanaku style undecorated libation bowl (CF-29) and a small pinchpot (CF-29) contained burned material. In addition, a number of burials (CF-3, -9, -15, -17, -18 and -19) had burned sections or some carbonized material within the interior of the tomb or had burned material above the tomb roof, although in these cases it is not clear whether the burned area or material indicates mortuary ritual or whether the burial had intruded into a pre-existing hearth or ash feature.

The People of Piñami: Health, Age, Sex and Status

To evaluate issues of demographic composition and overall health, I consulted with Bonnie Yoshida, who conducted bioarchaeological studies of the Piñami burial remains. Her studies yield age, sex and health data and provide baseline data on the population's nutritional status and its disease and activity patterns (see Appendix 3 for bioarchaeological summaries by burial). Further, I use Yoshida's research to correlate age, sex and health of the Piñami population with variations in burial treatment and to examine whether those correlations changed over time during the Middle Horizon.

Health. Yoshida notes a "mixed picture of health and disease patterns" for the human remains she studied from Piñami (Yoshida and Anderson 2007:8). The population had a high frequency of tooth enamel hypoplasia, which is an indication of systemic stress; however, other indicators of nutritional stress or infection were low and there were fewer tooth caries than is typical for maize-eating populations. Yoshida notes that while physical activity indicators show that life in Piñami was physically demanding, there is no evidence of interpersonal violence or trauma. There was no notable difference in the sexes in terms of health or disease. A noteworthy finding related to age was the relatively high number of individuals who died in adolescence. As will be discussed in more detail below, the only patterned variation that approached statistical significance was that there was a higher frequency of enamel hypoplasia among individuals buried in an on-the-side flexed position, 6 out of 10 (60%), than among those buried in a seated flexed position, 3 out of 13 (23.1%) (Yoshida and Anderson 2007:8).

Age. Yoshida analyzed the human remains from Piñami and was able to identify 37 individuals as to age at time of death. These 37 included all age categories, from infant to old adult (Table 6.5).

Table 6.5. Age Category Distributions of All Burials at Piñami.

Age Category	**No. Individuals**	**Percent**
Infant (0-2 years)	5	13.5%
Child (3-11)	6	16%
Adolescent (12-19)	5	13.5%
Young Adult (20-34)	3	8%
Middle Adult (35-49)	6	16%
Old Adult (>50)	1	2.5%
Adult (undetermined)	11	30%
TOTALS	**37**	**100%**

Dividing this age data by tomb type for Early and Late Group burials reveals certain patterns (Table 6.6). The clearest pattern is that urn burials in both Early and Late Groups, in cases where remains were available, only contained children (n = 3). Secondary burials (both cases were from the Early Group) contained adults (n = 2). The patterns for flexed burials varied by time period. In the Early Group, on-the-side flexed burials contained only adolescents or adults but not infants or children, and the seated flexed burials included individuals of all age groups. For the Late Group, the pattern is almost the reverse: the on-the-side burials included all age groups and the two seated flexed burials were children. (Table 6.6 shows an increase in the percentage of children and infants from the Early Group (24%) to the Late Group (50%), but the difference in child-to-adult ratio is most likely due to the PLANE excavation methodology for the Early Group, which overlooked the smaller bones, especially if they were unaccompanied by offering vessels.)

Table 6.6. Comparison of Early and Late Group Burials by Age Category and Tomb Type.

Early Middle Horizon Group Burial Types by Age and Burial Method						
Age Category	**Urn**	**Flexed seated**	**Flexed on-the-side**	**Secondary**	**Deviant or Disturbed**	**TOTALS**
Infant and Child	2	4	0	0	0	6 (24%)
Adolescent	0	2	1	0	1	4 (16%)
Adult	0	5	8	2	0	15 (60%)
TOTALS	**2**	**11**	**9**	**2**	**1**	**25**

Late Middle Horizon Group Burial Types by Age and Burial Method						
Age Category	**Urn**	**Flexed seated**	**Flexed on-the-side**	**Secondary**	**Deviant or Disturbed**	**TOTALS**
Infant and Child	1	2	2	0	1	6 (50%)
Adolescent	0	0	1	0	0	1 (8%)
Adult	0	0	5	0	0	5 (42%)
TOTALS	**1**	**2**	**8**	**0**	**1**	**12**

In both the Early and Late Groups there does appear to be a correlation between age and tomb complexity, with greater construction costs being used for adults. In the Early Group, almost all of the fully stone-lined and covered tombs where the bodies could be identified as to age contained adults or adolescents. For the Late Group burials, children were only found in irregular or shallow pits, and the more complex tomb designs contained adolescents or adults only.

Sex. Only 16 of the burials were well enough preserved for Yoshida to be able to identify the sex of the deceased as conclusively male or female, "probable" male or

female or "possible" male or female (Table 6.7 and Appendix 3). Unfortunately, the environment in the stone-lined tombs was such that bones were extremely poorly preserved, so we have no information as to the sex of the individuals in these presumably higher-status tombs.

Table 6.7. Burials Where Remains Could Be Identified as Male or Female. Individuals are designated as conclusive male or female, probable male or female or possible male or female. Conclusive and probable designations are grouped for statistical purposes.

Burial ID No.	Time Period	Burial Type	Quantity of Ceramic Offerings	Conclusive or Probable Male Female	Possible Male Female
CF-11	Early Group	Seated flexed	1	M	
CF-21	Early Group	Seated flexed	2	Prob F	
CF-45	Early Group	Seated flexed	3		Poss M
CF-48	Early Group	Seated flexed	No info	M	
CF-54	Early Group	Seated flexed	No info		Poss M
				2 **1**	**2** **0**
CF-8	Early Group	On-the-side flexed	4		Poss M
CF-10b	Early Group	On-the-side flexed	8	Prob F	
CF-15	Early Group	On-the-side flexed	5	F	
CF-16	Early Group	On-the-side flexed	6	F	
CF-17	Early Group	On-the-side flexed	No info	M	
CF-18	Early Group	On-the-side flexed	4	F	
CF-24a	Early Group	On-the-side flexed	1		Poss F
				1 **4**	**1** **1**
CF-28	Late Group	On-the-side flexed	3	Prob M	
CF-29	Late Group	On-the-side	3	F	

		flexed			
CF-31	Late Group	On-the-side flexed	1		Poss F
CF-32	Late Group	On-the-side flexed	0	Prob F	
				1 **2**	**0** **1**
TOTALS				**4** **7**	**3** **2**

Though sex differentiation has been noted in other Tiwanaku zones with respect to health and access to foods (Goldstein 2005; Hastorf 2006), such differentiation does not appear to be the case at Piñami. For example, Yoshida notes that at Piñami "sex differences in the . . . bioarchaeological indicators of health and disease appear minimal" (Yoshida and Anderson 2007:10).

With respect to the quantity of offerings, it is noteworthy that not only are females equal to males in offerings, but some of the highest quantity of offering vessels were found in female burials. As can be seen in Table 6.7, CF-10b (probable female) had 8 offering vessels, the greatest number of vessels in the Early Group outside the two burials with 12 each, and other Early female burials also had high numbers of offerings. In the Late Group, both males and females had up to 3 offerings and both could be interred in the highest effort tomb types (compare CF-28 and CF-29).

As already discussed in Chapter 5, the ceramic forms found accompanying males and females at Piñami were not restricted by sex. In other Tiwanaku sites like Moquegua, only males have *keros* and females have *ollitas* (Goldstein 2005:251). By contrast, *keros* and *ollitas* are found with both males and females at Piñami, and indeed females and males at Piñami were often accompanied by *both* a *kero* and an *ollita*. This lack of sex differentiation with respect to vessel forms, particularly in the Early Group

burials, is likely a continuation of a Cochabamba tradition. (See Chapter 5 for discussion of the association of gender and *keros* in the Late Piñami Phase.)

There is some evidence suggesting that body position at burial may be related to the sex of the individual, at least for the Early Group (Table 6.8). In Early flexed burials, 2 of the 3 conclusive or probable males (67%) were in seated flexed burials and only 1 (33%) in an on-the-side burial; the pattern was largely reversed for conclusive or probable females: only 1 of the 5 (20%) was in a seated flexed burial and the other 4 (80%) were in on-the-side burials. While the sample size is too small to be statistically significant, it would be worthwhile in future excavations of Middle Horizon Cochabamba to look for a possible correlation between sex and burial position.

Table 6.8. Comparison of Early Group Flexed Burials by Sex (Conclusive and Probable) and Body Position.

Early Group Flexed Burials	**Seated flexed**	**On-the-side flexed**	**TOTAL**
Male	2 (67%)	1 (33%)	3 (100%)
Female	1 (20%)	4 (80%)	5 (100%)

Higher Status Burials. Only two tombs can be considered significantly outside the norm in terms of quantity and variety of offerings, and they likely belonged to higher-status individuals. These burials, CF-27 and CF-36, are both from the Early Group. Both were rectangular stone-lined and roofed tombs. The preservation of human remains was very poor in both, but we can tell that CF-36 contained a single adult in an on-the-side flexed position. This individual's head was removed prior to burial. CF-27 contained an adolescent and an adult, with the adolescent placed first, below the adult (CF-27 is the only burial that clearly had two individuals). Preservation of human remains in CF-27

was extremely poor and we could determine age only by teeth and small bone fragments. Each tomb contained twelve ceramic vessels, a quantity outside the typical range of 0 to 8 offerings found in all other Early Group burials.

Not only was the quantity of ceramic offerings above the norm in these two tombs, but the assemblages were unusual in other ways as well. In both CF-27 and CF-36, the twelve ceramic vessels were made in a variety of local and Tiwanaku styles, including imported Tiwanaku Redware and Blackware, CVCT, Cochapampa, Caraparial and Mojocoya styles. As described in Chapter 5, in both burials the percentage of drinking vessels was particularly high (54% as opposed to 27% in other on-the-side flexed burials and 19% in seated flexed burials). These were the only tombs to include pairs of drinking cups (two pairs of identical cups in CF-36 and two pairs of almost identical cups in CF-27). Pairs of cups are often related to customs of reciprocal hospitality that is especially a requirement of those of higher status (Cook and Glowacki 2003).

Each of these higher-status tombs had offerings and evidence of associated ritual not found in other burials. Besides the high number of ceramic offerings, both burials were the only ones that contained sets of malachite stone beads. CF-36 had additional items unique to that tomb, including a carved triangular bone ornament, a couple of large sodalite beads, a large malachite bead, and two camelid phalange bones. Most notably, CF-36 also contained the only metal offerings in any burial. There were three pieces, two crumpled small sheets of metal of unknown original shape, one of copper and one of silver, and one intact silver plaque, described above (Figure 6.28).

These burials were unique in that each contained one imported Tiwanaku *kero* that was wrapped in maize leaves (Figure 6.31). CF-27 had maize leaf wrapping on an imported Tiwanaku Redware *kero* and CF-36 had maize leaves wrapped on an imported Tiwanaku Blackware *kero*. While the fact that we only found maize-wrapped *kero*s in these two tombs could be due to preservation, it is possible that this ritual wrapping on an imported *kero* was associated with rituals tied to higher-status individuals.

I consider these two burials to be of higher status due to the high quantity of offerings that make them outside the norm and due to the variety of additional factors that make them unique. It is unfortunate that we do not know the entire context for the placement of these burials, but we can note that they are not far in horizontal distance from other less complex burials of the same temporal context. If the individuals from these tombs were of higher status, the extra drinking vessels and the pairs of cups suggest that their rank entailed hospitality obligations for drinking rituals. The attributes of each burial reflect both Tiwanaku and local burial practices, possibly indicating that these presumably higher status individuals had obligations that included bridging local and Tiwanaku identities.

As is clear from this summary and synthesis, the Piñami burials have provided a wealth of information on Middle Horizon mortuary traditions for the Cochabamba Central Valley and have demonstrated differences between the mortuary traditions of the Early Piñami Phase and the Late Piñami Phase.

Ethnic and Geographical Affiliations of Piñami Burial Population

To determine the extent of Tiwanaku influence at Piñami, one ky question to explore is the ethnic and geographical affiliation of the population, particularly during the transitional Illataco and Early Piñami Phase. What does the available burial evidence suggest about the population of Piñami--was it comprised of Cochabamba natives, Tiwanaku immigrants or a mix? To answer this question, I examined my Piñami mortuary findings and the results of specialist studies on cranial deformation and strontium isotope analysis to look for evidence of a multi-ethnic population or of migration. While the burial sample size is small, the results point to a multi-ethnic community and at least some immigration, especially during the Illataco/Early Piñami Phase.

Varying Burial Traditions in the Early Group--Tomb Types and Offerings

In examining the wide variety of burial traditions in Early Group burials, I noted correlations that suggested divisions of the community into at least two groups that lived side by side at Piñami. Particularly striking was the correlation between body position and a number of other aspects of the burials, so I formed the hypothesis that the two types of flexed burials represented two different sets of traditions. To test this hypothesis, I compared vessel style, total vessel quantities, age and health to see if these factors correlated with one burial type or the other.

I first compared styles of vessel offerings present for each of the two flexed burial traditions but found no correlation. Both included offerings of imported Tiwanaku vessels, CVCT vessels and local vessels.

I next examined the total quantities of vessels per burial and found a strong correlation with burial type, as set out above. Seated flexed/round burials had notably fewer offerings than on-the-side flexed/rectangular burials (Figure 6.22).

A second correlation between the two flexed burial traditions of the Early Group concerns age range. Individuals buried in the seated flexed position included all ages, infants through adults, whereas individuals buried in the on-the-side flexed position were only adults or adolescents (Table 6.6). (It is possible that the children associated with these on-the-side flexed adults or adolescents were either buried in urns, since urns contained only children, or buried in a separate cemetery; alternatively, it is possible that the absence of children in on-the-side flexed burials is due to excavation procedures of PLANE, which did not record burials if there were no offerings or marker stones.)

Analysis of health indicators reveals a third correlation with possible implications for my hypothesis that the individuals in the on-the-side flexed burials and the individuals in the seated flexed burials represent two different groups. As laid out above, Yoshida examined health variables indicative of nutritional status, disease, injury and activity patterns and compared them by age, sex and burial type. She found that only one correlation approached statistical significance: that of burial position and enamel hypoplasia frequency. She notes that 6 of 10 (60%) of the on-the-side individuals had enamel hypoplasia, whereas only 3 out of 13 (23.1%) of the seated flexed individuals had enamel hypoplasia. Yoshida suggests a possible implication of this pattern:

> If this was a significant relationship, it might suggest that the individuals buried in a seated, flexed position (the burial style characteristic of highland and Moquegua Tiwanaku) had a favored social status, and perhaps enjoyed differential access to resources. Alternatively, as enamel hypoplasia reflects childhood stress, this variation might be attributable to childhood spent in a different environment. As this constitutes only a single skeletal indicator, it is not particularly meaningful at present, but it may merit more investigation should new data become available. (Yoshida and Anderson 2007:10)

These correlations between burial position and quantity of vessels, health indicators and (to a lesser degree) age variation inclined me to believe that the two major body position types represented two related but distinctive burial traditions. The next step was to consider these two traditions in terms of Tiwanaku influence. I hypothesized that the seated flexed burials were more likely to show Tiwanaku traits than were the on-the-side burials since seated flexed burials were rare in the Central Valley during the Formative (unlike on-the-side burials) and the seated flexed position was the most common type at Tiwanaku and its peripheries.

Of the three correlations I found, the differences in health indicators and range of ages neither support nor contradict this hypothesis. However, the correlation between body position and quantities of vessels does support my hypothesis by associating a Tiwanaku-like trait more closely with one body position than the other.

A high number of ceramic offerings is frequently found in Middle Horizon burials of the Western Valleys but is not common in other Tiwanaku zones. Korpisaari sees high numbers of offerings as a key distinction between Middle Horizon Cochabamba mortuary traditions and those of Tiwanaku (Korpisaari 2006:110). This higher number of vessels, however, may not be a uniformly Cochabamba trait. At Piñami we seem to see two contemporaneous traditions for offering quantities: the burials with higher numbers of offerings are all associated with the on-the-side burial tradition. In contrast, seated flexed

individuals had fewer vessels. Since a low number of offerings (a typical Tiwanaku trait) is correlated with the seated flexed position (also a typical Tiwanaku trait), I am inclined to believe that the people buried in the seated flexed position are more directly aligned with Tiwanaku and highland sensibilities on mortuary ritual than are those in on-the-side flexed burials.

In sum, three correlations in the mortuary data—between body position (on-the-side flexed as compared to seated flexed) and quantity of vessels, age range and enamel hypoplasia—point to two distinct burial traditions. Of these two traditions, one is more similar to Tiwanaku: the seated flexed position combined with a lower number of offerings. While the evidence is not conclusive, I am inclined to accept as a working hypothesis that at least two ethnic groups were living side by side in Early Middle Horizon Piñami. Specialist studies by Bonnie Yoshida on cranial deformation and strontium isotope analysis undertaken by Cristin Lucas offer further insight into this question.

Cranial Deformation--Study by Bonnie Yoshida

Cranial deformation is an unalterable and visible marker of social and ethnic identity and has been key in ethnic studies in the Andes (Blom 1999). Therefore, the presence of more than one type of cranial deformation in a contemporaneous cemetery population is a likely indicator of an ethnic mix.

Cranial deformation is done while a person is very young and the skull is still highly malleable. Typically, it begins in infancy and involves wrapping the baby's head

or placing it between two boards. Different methods result in visually distinctive skull shapes. Two major types of deformation are the most common in the pre-Columbian Andes: fronto-occipital and annular (Blom 1999; 2003). Both types were found at Tiwanaku itself but were regionally distinct in the peripheries. At the Tiwanaku periphery Lukurmata and elsewhere in the Katari Basin, to the east of the capital, annular deformation was the most common. At Moquegua, to the west of Tiwanaku, fronto-occipital deformation was dominant. Moquegua is especially important to the study of cranial deformation due to the large number of burials and excellent preservation; studies have shown that all cranial deformation was fronto-occipital in the Chen Chen and Omo cemeteries of Moquegua, present in 82% of the Chen Chen adult crania (n = 402) and in 97% of the Omo adult crania (n = 35) (Blom 1999; Goldstein 2005:256-257). Döllerer found that both types of deformation were present at Sierra Mokho in the Central Valley, but they were distinct temporally, changing from macrochephaly during the Early and Middle Formative to turricephaly during the Late Formative and Middle Horizon (Dollerer 2013:210-397)[11].

At Piñami, cranial preservation was poor. We have only five crania, three from the Early Group and two from the Late Group, that are complete enough for analysis as to cranial deformation (Table 6.9). Yoshida examined these crania and determined that four of the five showed evidence of cranial deformation (Figure 6.32).

For the three Early Group crania, all three (100%) showed evidence of deformation. Two were fronto-occipital (CF-11, adult male, and CF-12, child) and one was annular (CF-18, adult woman). Each of these three individuals was accompanied by an imported Tiwanaku *incensario* or effigy vessel and two (CF-12 and CF-18) were also

accompanied by local style vessels. Strontium isotope data (to be discussed below) shows that the child (CF-12) was a life-long inhabitant of Cochabamba. Whether the other individuals with cranial deformation were local or immigrants cannot be determined based on current evidence. Of the two Late Group crania that could be evaluated (CF-29 and CF-32), only one (50%), CF-29, clearly had cranial deformation. CF-29 was an adult woman with fronto-occipatal deformation buried in an on-the-side flexed position. The other individual, CF-32, adult female, appears to be without deformation.

Table 6.9. Comparison of Cranial Deformation by Temporal Grouping, Burial Type and Related Imported Offering.

	On-the-side flexed	**Seated flexed**
Early Group	CF-18 annular (accompanied by imported Tiwanaku *incensario*)	CF-11 fronto-occipital (accompanied by Tiwanaku llama *incensario*) CF-12 fronto-occipital (accompanied by a Tiwanaku effigy vessel, *kero* and Sauces *jarra* and *tazón*)
Late Group	CF-29 fronto-occipital (accompanied by *ollita*) CF-32 unmodified (no offerings)	No examples

The evidence is sufficient to prove that two types of cranial deformation techniques were present in the Early Group, fronto-occipital and annular, and these correspond with the two flexed positions. The individual with the annular deformation was buried in an on-the-side flexed position, and the two with fronto-occipital

deformation were both buried in a seated flexed position. However, the burials with cranial deformation were not segregated spatially; all three examples were located within the same Early Group cemetery, though CF-18 may have been interred a bit earlier than CF-11 and CF-12.[12] For the Late Group, two types of crania were also present: fronto-occipital and unmodified. Because cranial deformation is such a key marker of ethnic identity, Yoshida's findings seem to reflect a multi-ethnic population at Piñami, particularly during the Illataco/Early Piñami Phase.

Strontium Isotope Analysis by Cristin Lucas

The most direct evidence we have for the origin of the Piñami population is via strontium isotope analysis. Strontium isotopes are found in water supplies and vary regionally based on the levels found in the base rock of the region. Strontium can be found in both teeth and bones. In teeth, strontium is bound permanently while the teeth are forming during childhood; in bone, however, it is continuously replaced. Thus, teeth show the characteristic strontium isotope ratios of the water from a person's childhood region, but bones, since they are constantly regenerated, reflect the water supply for the last few years of a person's life (Lucas 2012). If a person from Piñami, for example, has bone strontium ratios consistent with the local water supply but teeth that differ in strontium ratios, then that person spent childhood in a different region, then migrated and lived in Cochabamba after childhood. If a person's bones and teeth are both *similar* in strontium ratios to the local water supply, we can assume that person grew up and died in the local region. If a person has bones and teeth that both *differ* in strontium ratios from the ratios

in the local water supply, then that person likely came from another region and was either a visitor or a very recent immigrant. Further, since the strontium isotope ratios are diagnostic by region, we can determine not only if a person is non-local but also the region of the Andes from which that person came. It should be noted that this methodology does not show evidence of migration within, for example, a large region with a single strontium signature throughout.

Lucas analyzed teeth and bones from six individuals from Piñami (Lucas 2012). These included five individuals from the Early Group and one individual from the Late Group (Table 6.10).

Table 6.10. Table of Bone and Tooth Enamel Samples Analyzed by Lucas, including her conclusions (Lucas 2012). Adapted from Lucas, Tables 5.1, 6.3 (2012:49).

Lucas Sample #	**Piñami CF #**	**Body Position**	**No. of Ceramic Offerings**	**Vessel Style**	**Tooth Enamel and Bone Results**	**Interpretation**
Early Group						
402	CF-12 (child) sex undetermined	Seated flexed	4	T, CT, ?	Cochabamba Enamel and Bone	Lifelong Cochabamba
404	CF-16 (adult) female	On-the-side flexed	6	T, CT	Cuzco Enamel/ Cochabamba Bone	Immigrant—child in Cuzco—adult in Cochabamba
412	CF-27 (adult) sex undetermined	On-the-side flexed	12	T, CT, local	Cochabamba Enamel and Bone	Lifelong Cochabamba
423	CF-45 (adult) possibly male	Seated flexed	3	Local	Tiwanaku Enamel and Bone	Migrant from Tiwanaku or recent immigrant

424	CF-47 (adult) sex undetermined	Seated flexed	3	T, local	Cochabamba Enamel and Bone	Lifelong Cochabamba
Late Group						
414	CF-28 (adolescent) possibly male	On-the-side flexed	3	CT	Cochabamba Enamel and Bone	Lifelong Cochabamba

Style Vessels: T=Imported Tiwanaku; CT=Cochabamba Tiwanaku; ? =vessel lost before style assessed; local = Sauces, Cochapampa

For the five Early Group people analyzed, four were adults and one was a child. Three of these individuals, the child (CF-12) and two adults (CF-27a and CF-47), had local values for strontium isotopes for both teeth and bones, indicating they grew up in and spent the last few years of their life in Cochabamba. Each of these individuals was buried with both imported Tiwanaku and local Sauces or Cochapampa style vessels. CF-12 and CF-47 were buried in a seated flexed position, whereas CF-27 was buried in a rectangular stone tomb, presumably on-the-side flexed. The remaining two individuals showed non-Cochabamba values for teeth or teeth and bones. CF-45, a probable male adult, showed both teeth and bone ratios characteristic of the highlands near Tiwanaku. Lucas suggests that this finding indicates he was either a very recent immigrant to Piñami or he was a migrant trader (*caravanero)* with a home base near Tiwanaku. This individual was buried in a seated flexed position with two local style offerings and an undecorated *ollita*. The other non-local person, CF-16, was an adult female with teeth strontium ratios similar to those of the Cuzco area of Peru and bone values similar to those of Cochabamba. This data suggests the woman was born and spent at least her early childhood in the Cuzco region (or other area with a similar strontium signature) but

spent at least the last years of her life in Cochabamba, probably marrying into the community. The woman was buried in an on-the-side flexed position in a simple pit without marker stones. She was accompanied by six ceramic offerings; four were imported Tiwanaku vessels, one was a CVCT vessel and one was an *ollita*.

The one Late Group individual (CF-28) was an adolescent male whose teeth and bone strontium ratios were both local, indicating he spent his entire life within the Cochabamba region. He was buried in the on-the-side flexed position with a CVCT *kero*, a CVCT *tazón* and an *ollita*.

This analysis proves that the Early Group population of Piñami did include immigrants to Cochabamba. Lucas's findings showed that two of the five people examined originated outside of Cochabamba. One was a male (CF-45) who was either transient or recently immigrated from the region of Tiwanaku. One was a female (CF-16), born elsewhere, possibly the Cuzco region of Peru, who became a longtime resident of Cochabamba, at least in the later years of her life. In statistical terms, 40% (2 out of 5) of the Early Group sample analyzed were non-local and came from either the region around Tiwanaku or farther north.

Summary

These three studies (my analysis of correlations based on body position, Yoshida's study of cranial deformation and Lucas's study of strontium isotopes) all support a multi-ethnic composition at Piñami during the time of the Early Group burials. Correlations of body position with offerings, with health indicators and with range of age point to two

traditions, with the seated flexed tradition more similar to Tiwanaku than the on-the-side flexed tradition. Further, the two kinds of cranial deformation found by Yoshida, fronto-occipital and annular, also point to the presence of two ethnic groups. In addition, variation of strontium ratios found by Lucas point to immigrants in the Early Group population. These specialist studies support the view of a multi-ethnic composition at Piñami during the Illataco and Early Piñami Phase occupations.

Discussion

How do mortuary findings help answer the principal questions addressed by this dissertation? In other words, what does the Piñami evidence reveal about Tiwanaku, Cochabamba and the relationship between the two, and how does the evidence help refine Central Valley chronology? The following sections address these issues by setting out the ways in which the Piñami burial data demonstrates strong Tiwanaku influence and by drawing attention to findings that support a revised Central Valley chronology.

Evidence of Tiwanaku Influence

Strong Tiwanaku influence in the Central Valley is most clearly seen in three aspects of the mortuary evidence of Piñami: ceramic offerings, body position/burial type and tomb construction technique.

Ceramic Offerings. Ceramic offerings show Tiwanaku influence was widespread. Tiwanaku/CVCT vessels are common as burial offerings starting at the beginning of the Middle Horizon. In the Early Group, they comprise 38% of all offering vessels (n = 104) and 53% of the decorated vessels (n = 76). Over time, the Tiwanaku style becomes dominant, and by the Late Group burials, *all* the decorated vessel offerings, with the exception of one vessel of undetermined style, are CVCT.

It is striking that Tiwanaku style vessels in the Early Group burials are so strongly represented. As with the fineware in domestic contexts, Tiwanaku style vessels in the burials were present in high frequencies at the very onset of the Middle Horizon, with CVCT becoming dominant over all other non-Tiwanaku local styles by the Late Group burials.

A change in quantities of vessel offerings also seems to reflect Tiwanaku influence that increases over time. Early Group burials had a range of offerings from 0 to 12 vessels, with an average of 4.4 per burial for burials that contained at least one offering. The Late Group had an average of 2.7 vessels per burial that contained at least one offering, and only 1.3 vessels per burial of burials overall. The Late Group quantity is in keeping with Tiwanaku quantities of offerings, which typically range from 0 to 2 vessels (Korpisaari 2006:157).

Body Position/Burial Type. The Piñami burials indicate Tiwanaku influence on body position through the presence of seated flexed burials, through the disappearance of extended burials and through a decrease in urn burials.

In the Cochabamba Western Valleys during the Formative, on-the-side flexed, fully extended and urn burials were the norm and seated flexed burials were rare. In

contrast, at Middle Horizon Piñami we find the seated flexed position among the earliest burials of the Early Group. Of the 26 Early Group flexed burials, over half, 54%, were seated flexed/round pits. The prominence of seated flexed burials at the beginning of the Middle Horizon suggests Tiwanaku influence in burial position, since burials at Tiwanaku and its peripheries were predominantly seated flexed (though on-the-side flexed burials were also present, especially at Lukurmata and the Taraco peninsula) (Korpisaari 2006:93-99).

Extended position burials were found in the Cochabamba valleys from the Early to the Late Formative. These include face-up and fully extended burials, such as at Sierra Mokho or Conchupata, or more haphazardly extended, such as at Sierra Mokho and Santa Lucía (Döllerer 2013; Gabelmann 2015; Pereira Herrera et al. 1992). However, *no* extended burials were found at Piñami throughout the Middle Horizon, another likely example of the influence of Tiwanaku, where extended burials were rare.

A third change reflecting likely Tiwanaku influence concerns urn burials. Urn burials were common in the Formative in the Cochabamba Western Valleys and were used for adults and children at nearby Sierra Mokho and Colcapirhua during the Late Formative (Bennett 1936; Döllerer 2013), but they were rare at Tiwanaku. At Piñami, we do see the continuation of urn burials, but they are only used for children and they are reduced in frequency over time.

Tomb Construction Techniques. There was a decided change in complex tomb design and construction techniques at Piñami at the onset of the Middle Horizon. While the simple tomb types present in Late Formative Cochabamba, such as irregular pits and pits covered with stone slabs, continue into the Middle Horizon, the design and

construction techniques for the more complex stone-lined tombs at Piñami are different from those of the complex tombs of the local Formative and are instead very similar to those found at Tiwanaku and its peripheries.

Stone-lined tombs are rare in the Western Valleys during the Formative, and the most numerous examples come from Sierra Mohko (Döllerer 2013). At Sierra Mokho, during the Early, Middle and Late Formative, stone-lined tombs were used, but they were constructed using unevenly sized and shaped thin slabs placed vertically around the chamber interior. The size and shape of these tomb chambers varied widely, from large chambers (2 m by 1 m) to long, thin chambers (2 m by .5 m) to small chambers (.5 m by .5 m) (see tomb drawings in Döllerer 2013:207-424).

Stone tomb construction at Piñami generally differs from that of Sierra Mokho but resembles that found at Tiwanaku sites and its peripheries. At Piñami, stone tombs used layered courses of oblong or squarish stones to form the wall facades.[13] The chambers were very consistent in size and shape (Figures 6.12 and 6.13). The interior space for rectangular tombs was typically .5 m wide by ~1 m long by .5 m deep, contrasting with the variable size and shape of stone tombs at Sierra Mokho during the Formative but entirely in line with the typical dimensions found for the rectangular or oblong tombs at Lukurmata, which averaged .5 m wide by .9 m long by .5 m deep (Korpisaari 2006:99). The sole round stone-lined tomb at Piñami, CF-53, was similar in construction techniques and size to round stone-lined tombs found at Tiwanaku and its peripheries (Korpisaari 2006, Goldstein 2005:245-246). Middle Horizon Piñami's stone-lined tombs are therefore more similar to those at Tiwanaku and its peripheries than they are to those at

nearby Sierra Mokho in the Formative (Bermann 1994; Döllerer 2013; Goldstein 2005; Korpisaari 2006).

The apparent change in construction technique and the greatly increased consistency in dimensions are important not only because they indicate a new technological style for the appropriate way to make stone-lined tombs, but also because they point to the adoption of a new mental template for the appropriate dimensions. These changes in construction technique and consistency of dimensions continued into the Late Piñami Phase, even when stone was abandoned and complex tombs were lined with adobe blocks. The adobe tombs remained quite similar in size to their stone-lined predecessors and used courses of adobe blocks with clay mortar. Even the one free-standing adobe-walled tomb (Figure 6.15) had the same interior dimensions as the Early Piñami stone tombs and as the Tiwanaku rectangular tombs.

This near uniformity over the entire Middle Horizon of size, shape and building method and the similarity of these characteristics to Tiwanaku tombs suggest that the Tiwanaku complex tomb design was internalized by the people of Piñami. As with the local production of Tiwanaku fineware ceramics, the consistency of the technological style of tomb construction suggests more than incidental observation of Tiwanaku tombs; rather, it suggests close contact with people from Tiwanaku who held these building traditions and made a conscious choice to emulate them.

These three aspects of the mortuary findings–ceramic offerings, body position and tomb construction techniques—clearly show strong Tiwanaku influence on Piñami burial traditions. In particular, tomb construction techniques are important in that they suggest a change in the mental template and adoption of Tiwanaku technological style.

The burial findings show strong evidence of Tiwanaku influence but do not support a model of wholesale replacement by immigrants. The Early Group continuation of both local methods of interment and the presence of local vessel styles as common burial offerings points to the continuation of a pre-existing population at Piñami.

The burials also do not support a model of diffusion of Tiwanaku traits. The addition of a new and suddenly common burial position, the change in tomb construction and the widespread frequency of imported Tiwanaku vessels are suggestive of immigrants in the population.

Temporal Distinction in Burials: Early Group vs. Late Group

There are marked differences between burials from early in the Piñami Phase and those from late in the Piñami Phase. These changes in burial patterns are so distinctive that the mortuary evidence is a key reason I argue that the Piñami Phase should be sub-divided into Early Piñami Phase and Late Piñami Phase. Notable change from the Early Group to the Late Group burials can be seen most clearly in these three aspects: reduction in ceramic and sumptuary offering type, quantity and variety; change in complex tomb construction material from stone to adobe, and increasing homogeneity in body position.

Ceramic and Sumptuary Offerings. As set out in detail above, there were changes over time in quantities of offerings and in the ranges of styles and types of ceramic offerings. The number of offerings per burial with offerings drops by half from the Early Group to the Late Group. The number of styles present in offering vessels drops dramatically from the Early Group to the Late Group, from nine or more styles to two. In

the Early Group burials, we found a full complement of vessel types, but by the Late Group burials, the offerings consisted of only four vessel types. In addition, decorated fineware offerings, as compared to undecorated utilitarian vessels, are reduced from the Early burials (80% of the total offerings) to the Late burials (50% of the total offerings).

Sumptuary goods, such as stone beads and metal plaques, are present in Early Group burials but not in Late Group burials. This reduction in sumptuary goods is similar to what was seen at Tiwanaku, where beads and gold and silver were more common in the Formative than in the Middle Horizon (Korpisaari 2006:156), possibly indicating in both cases a restricted access to these goods over time. Also reduced from Early to Late is the number of imported fineware vessels from Tiwanaku. In the Early Group, over 50% of the burials had imported fineware vessels from Tiwanaku, including highly crafted *incensarios* and effigy vessels. The only clear imported vessel in the Late Group was the undecorated *tinaja* from the urn burial, CF-43.

Tomb Construction. A major temporal change in construction technique from Early to Late was the transition away from stone in burials. Of the Early Group burials, approximately 50% used stone (for vertical markers, cover or collars, or tomb lining). In the Late Group, *no* stone was present in any of the tombs. Instead, the most complex tombs were lined or walled with adobe, and adobe blocks could be used to form a tomb cover.

Body Position. Over time, burials become more homogeneous in terms of body position. Of the 31 Early Group burials, 14 (45%) were seated flexed/round pits, 12 (39%) were on-the-side flexed or oval/rectangular pits, 3 (10%) were urn burials and 2 (6%) were secondary burials. By contrast, of the 11 Late Group burials, 1 (9%) was an

urn burial, 1 (9%) was a semi-flexed, face down burial, 2 (18%) were round/seated flexed burials, but the clear majority, 7 (64%), were on-the-side flexed burials.

Overall, the burial evidence supports a distinction between the Early Piñami Phase and the Late Piñami Phase. Transitions in quantity, style and type of offerings, in tomb construction technique, and in body position demonstrate different characteristics for each phase. Burials become more homogeneous in all these characteristics in the Late Group. In particular, the richness and variety found in the burial offerings of the Early Group are diminished.

Conclusion

The Piñami burials are important for a number of reasons. First, they comprise a sizeable, well-documented sample from two temporally separated Middle Horizon contexts. Over 60 funerary contexts were found and at least 43 of those were complete enough to allow for comparisons and preliminary conclusions about the spread of Tiwanaku influence to the Cochabamba Central Valley. The mortuary evidence allows us not only to learn from the human remains themselves (concerning health of the population, spread of disease, geographic origin of the deceased, etc.) but also to examine the choices made by individuals as they buried their dead (how they prepared and placed the bodies, what gifts they laid beside them, etc.). Because the burials span the Middle Horizon, we have the opportunity to see how these health factors and choices about ritual

changed from the early to the late Middle Horizon. Specifically, we have a substantial body of evidence from which we can draw conclusions about the influences over time of Tiwanaku on Cochabamba and based upon which we can develop a model of how the change took place in Piñami society.

At Piñami, the living were always close to their ancestors. Piñami burials were either within active domestic space, such as under floors, or in cemeteries that cut into space previously used for domestic functions. Indeed, in the case of the two cemetery clusters that we found, it is clear that those areas eventually returned to domestic functions after they were no longer used as cemeteries. Thus, the Piñami mound is both an area of domestic habitation and a necropolis. In Piñami homes, the remembered dead were nearby, visible in cemeteries or literally incorporated into the house. Long-dead ancestors, though no longer visible, were part of the living mound.

This chapter has made the case that Tiwanaku substantially influenced Piñami burial rituals, resulting early on in a variety of styles and practices that over time became more homogeneous. A comparison of the ceramic style evidence from Chapters 3 and 4 with the mortuary evidence of this chapter reveals that Piñami burial traditions do not change as quickly or completely to Tiwanaku patterns as do other aspects of community practice such as domestic fineware and drinking rituals. This means that in the Early Piñami Phase people are buried with foreign styles or with local styles, some of which are no longer being produced, while in their daily life they are drinking and eating from CVCT vessels almost exclusively. This contrast suggests some heirlooming of special vessels that are tied to the past and placed within burials, while in daily life household drinking and eating are done using more up-to-date styles as part of negotiating with the

living. By the time of the Late Group burials, the burial offering styles have caught up with the ceramic styles used in daily life and the CVCT style is dominant in both the mortuary and domestic arenas.

As to the ethnic make-up of the Piñami population, the evidence shows there was some ethnic variation and I have argued that the two flexed burial positions reflect two related sets of mortuary traditions, one more closely tied to Tiwanaku than the other. My argument that this patterned variation could represent a multi-ethnic population is supported by the evidence of variable cranial deformation in the population and by the strontium isotope studies that demonstrated the presence of people from outside the Cochabamba Valleys, specifically from Tiwanaku and farther north. However, amidst this variation, traditions were not segregated spatially within the Early Group cemetery, which had seated flexed, on-the-side flexed, urn and secondary burials all intermixed within meters of each other in horizontal space and corresponding to close stratigraphic levels. Likewise, we did not find segregation of individuals with distinct cranial deformation styles or the separation of local and non-local individuals within the cemetery. So, while there does seem to have been some ethnic diversity in the population, the people of Piñami shared the same mortuary space. This intermixing of burial traditions appears to differ from what is found in other Tiwanaku peripheries where spatially segregated cemeteries or ethnic enclaves within larger cemeteries are the more common patterns (Bermann 1990, 1994; Goldstein 2005:241; Korpisaari 2006).

An important question in reconstructing past societies is whether there is any evidence of status or rank differentiation. Our Piñami team was particularly fortunate in finding two burials that I conclude to be of higher status. They contain more types and

quantities of offerings than do any of the other burials. Not only that, but they each contain double pairs of cups, probably related to hospitality obligations and specialized social functions related to drinking maize *chicha*. Such obligations and responsibilities might be similar to those of the current Aymara community leaders (*mallkus*), whose authority rests in consensus building among factions and reciprocity obligations among followers (Janusek 2008:54-56). It is noteworthy that these burials do not show solely Tiwanaku or solely local traits. Instead they are a blend of local and Tiwanaku in offering styles, body position and tomb construction methods. These two burials do not indicate stronger ties to Tiwanaku than do the other Piñami burials, but I am inclined to believe that the individuals did have special responsibilities to bridge the various identities present at Piñami during the transitional Early Middle Horizon.

The mortuary results from Piñami present a diachronic view of Tiwanaku expansion and local response that is complex and fascinating and provides a manifestation of Tiwanaku expansion that is different from what is found in other regions. The early burials do not indicate that Piñami was a diaspora of purely transplanted Tiwanakans (as found in Moquegua) or a segregated enclave of Tiwanaku immigrants within a larger local population (as found in Azapa), nor does the evidence suggest solely long distance trade of Tiwanaku goods (as found in San Pedro de Atacama) (Goldstein 2005; Korpisaari 2006). Instead the burials indicate, I would argue, the movement and incorporation of people from Tiwanaku and beyond to Piñami—people who intermixed with local people and likely intermarried. The Early Group burials evidence great variety and suggest that even from the early Middle Horizon, Tiwanaku vessels and mortuary customs were accepted and emulated. By the time of the

Late Group, we can see the results of this blending over time: Tiwanaku patterns continued to be strongly expressed, though there was a distinctly Cochabamba flare to the more homogeneous traditions. As seen in the Piñami burials, the widespread access to and acceptance of Tiwanaku traditions alongside the preservation of local traditions reflect the nature of the Tiwanaku state, which allows variability in an outlying region.

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[1] I am not including here the rich San Sebastian burial from the Central Valley (Korpisaari 2006:106-107; Money 1993). The burial included a gold diadem, gold bowls, two gold pectorals and numerous gold disks. Although there was no diagnostic pottery found (or retained), the burial was generally assumed to date to the Middle Horizon based on similarities between the San Sebastian diadem and Tiwanaku diadems (Sagárnaga 1995:272). However, because Döllerer found at Sierra Mokho similar gold items, including a diadem, bowls and small disks from Early and Middle Formative contexts (Döllerer 2013), I am not convinced the San Sebastian burial dates from the Middle Horizon and think it more likely dates from the Formative.

[2] We also lost some of the information due to PLANE excavation methodology and some looting. Details of each burial's completeness are presented in Appendix 2. See also Chapter 1 on methodology.

[3] As was discussed in Chapter 1, the methodology of excavation for the two clusters of burials was distinctive. The Early Group burials were excavated largely by PLANE. The Late Group burials were, with the exception of CF-20, excavated completely by our team. The result is that we have more complete context information for the Late Group burials than for the Early Group.

[4] Based upon photo evidence, it appears that there were at least two other likely Early Group urn burials in the same Early cemetery cluster (see Appendix 2, CF-64 and CF-66). In neither case could we confirm any evidence of human remains. CF-64 was apparently a large round *olla* with a broken rim that appears to have typical Middle Horizon paste. CF-66 was unique. It included a large *tinaja* with modeled lizards on the upper body next to a medium U-shaped *olla*. Both of the CF-66 vessels are clearly Monochrome style in form and decoration, marking them as almost certain remnants of the Formative Period, and are the only whole Monochrome vessels found in the Piñami burials. The context of CF-66, Level 15, is Early Piñami Phase, by which time CVCT style had already replaced all the local styles in contemporaneous domestic contexts.

[5] Goldstein notes that at Moquegua, where preservation was extremely good, the mummy bundles were bound by fiber ropes (Goldstein 2005: 245). CF-36 contained some evidence of likely fiber ropes (Appendix 2).

[6] Possibly the somewhat unusual dominance of the western orientation of the deceased is due to the fact that Tiwanaku itself is located to the west-northwest of Cochabamba.

[7] Because Early Group burials without offerings were likely not recorded by PLANE and may be quite underrepresented, I compare the number of vessels placed in tombs containing at least one vessel. The number of burials recorded with *no* offering vessels was only 4% in the Early burials (1 of 25). In the Late Group, where *all* burials were recorded, the number without offerings was 50% (6 of 12).

[8] Interestingly, neither Tupuraya nor Quillacollo, the painted styles typical of the Central Valley during the Late Formative, were present as offerings in the Early Middle Horizon burials. However, Tupuraya and Quillacollo were present in Illataco Phase domestic contexts at Piñami.

[9] CF-10a is not a confirmed burial. It was a round chamber that was not completely excavated during the PLANE excavations and of which our team was unable to finish the excavation. Only the offerings were revealed by PLANE; no human remains were found, though they are likely still intact in the bottom of the chamber.

[10] It is possible that there were other Early Group burials with camelid bones, but PLANE may have removed them without noticing.

[11] Dollerer refers to cranial deformation types as *Turrizephalus* (turricephaly) and *Macrozephalus* (macrocephaly). He refers to macrocephalus as "the long head" (Dollerer 2013:210).

[12] CF-18 is from Level 19 in Sector A and CF-11 and CF-12 are from Level 14 in Sector B. However, we cannot be certain how temporally distinct Level 19 of Sector A is from Level 14 of Sector B, since PLANE excavated in inconsistent, arbitrary levels between the sectors. Sector A was excavated in fairly consistent 20 cm levels, whereas the arbitrary levels of Sector B averaged about 25 cm per level. CF-11 and CF-12 were close enough in space and depth that they can be assumed to be interred close in time.

[13] CF-44, a small square chamber, is an exception. It used only vertical slabs. No human remains were found by the time my team had access to the burial, but the small size may indicate a child burial or possibly a ceramic offering. See Appendix 2.

Table List for Chapter 6

Figure List for Chapter 6

Chapter 7: Household Architecture and Daily Life at Piñami during the Middle Horizon

Fineware ceramics and burials are rich sources for archaeological analysis, and previous chapters have considered at length these two categories of evidence to show Tiwanaku influence in the Cochabamba region. My Piñami excavations yielded, however, an even greater range of artifact types. An in-depth examination of these artifact types is beyond the scope of this dissertation, yet even a summary of my team's findings with respect to these other categories of evidence will shed light on the day-to-day domestic life of Middle Horizon Piñami and on relations between Tiwanaku and Cochabamba. This chapter offers such a summary, with topics including domestic architecture and features, utilitarian ceramics, food use and its preparation, weaving, ritual activities and the increasing importance of maize and camelids. In presenting and analyzing my findings, I also draw attention to evidence relevant to my inquiry into the influence of Tiwanaku on Piñami. The chapter ends with a discussion highlighting four key issues: the evidence of intensification of food production, the implications of large hearths and a "clean room", the presence of ritual and quotidian artifacts characteristic of Tiwanaku and the ideological significance of Piñami's architectural layout.

Domestic Architecture

My Piñami excavations revealed detailed evidence of domestic architecture for the Cochabamba region during the Middle Horizon. In the following sections I will first review for comparison architecture from the Cochabamba Formative and from Middle Horizon Tiwanaku and then discuss various aspects of Middle Horizon architecture as seen at Piñami. I begin by examining layout and orientation of domestic architecture, drawing particular attention to the aspects of Piñami that resemble what was found at Tiwanaku. I look next at construction materials and techniques, especially the use of *tapia*, and I finish with surveys of household features and ritual spaces, including "clean rooms" similar to those found at Tiwanaku and Lukurmata.

Cochabamba Architecture during the Formative

No Formative architecture was recovered at Piñami or Quillacollo, but research at Santa Lucía and Sierra Mokho in the Western Valleys has given us architectural evidence from the Middle and Late Formative (Brockington et al. 1985, Brockington et al. 1995; Döllerer 2004, 2013; Gabelmann 2005, 2008).

At Santa Lucía in the High Valley, approximately 40 km southeast of Piñami, Gabelmann mapped and excavated a large Middle Formative village. She found habitation structures composed of round, single-room houses averaging 3.5 meters to 6 meters in diameter (Gabelmann 2005; 2012a; 2012b). The walls of these domestic

structures were typically 20 cm to 50 cm in width and had stone foundations supporting *tapia* walls (Gabelmann 2012b:100).

Sierra Mokho, located approximately 2 km west of Piñami, was a long-term mound site occupied from the Early Formative through the Late Horizon. As explained previously, Sierra Mokho was the focus of two long-term excavation projects, the first by Brockington (Brockington et al. 1985, Brockington et al.1995) and the second by Döllerer (2013). Brockington's team found little Early and Middle Formative architecture at Sierra Mokho but did find a Late Formative habitation structure that was roundish in shape, approximately 4.5 meters in interior diameter, with stone foundations (Brockington et al. 1985, Brockington et al. 1995; Döllerer 2004:Lamina 38f).

In his excavations at Sierra Mokho, Döllerer (2013) changed the architectural story for the Western Valleys, uncovering architecture from all time periods after the Early Formative. Prior to his work, the evidence from Santa Lucía and Sierra Mokho indicated that round structures were the primary domestic layout during the Formative, in contrast with the rectilinear structures of the Middle Horizon (Anderson 2004, 2006). Döllerer's team found a wider variety of architectural forms for the Formative, including rectilinear walls and structures, than had been previously unknown in the Western Valleys, making the contrast between pre- and post-Tiwanaku architecture less dramatic.

Middle Formative Architecture at Sierra Mokho. The Middle Formative architecture Döllerer found at Sierra Mokho was extensive and unexpected. He found multiple round buildings with diameters up to 7 meters and stone wall foundations up to 1 meter in width. In addition, some of these round buildings had attached rectilinear rooms up to 4 meters in length. Döllerer interprets these large thick-walled buildings as

ceremonial platforms (Döllerer 2013). Buildings of this type had not been previously found in the Cochabamba valleys and suggest a greater level of complexity in Middle Formative social organization than had been postulated previously. These large structures were abandoned and covered or ritually closed toward the end of the Middle Formative (Döllerer 2013).

Late Formative/Early Middle Horizon Architecture at Sierra Mokho. Döllerer found markedly different architecture in the Late Formative than in the Middle Formative. Instead of ceremonial platforms, Late Formative Sierra Mokho contexts had habitation structures with mostly rectilinear walls made out of some type of adobe. The walls of these structures were typically 40 cm to 50 cm in width and some of the walls had stone foundations (Döllerer 2013). The orientation of these rectilinear buildings appears to have been generally north to south (Döllerer 2013: see Laminas).

Döllerer did find structures with wall orientations slightly east of north from what he identifies as later occupations of the Late Formative (Döllerer 2013: see Laminas). However, a few of the burials from these occupations had Tiwanaku-style vessels, and it therefore seems more reasonable to consider the occupations as being of the Illataco Phase rather than of the Late Formative. That is, they apparently belong to the Middle Horizon.

Tiwanaku Domestic Architecture During the Middle Horizon

The following is a summary of key aspects of Tiwanaku domestic architecture as evidenced from the sites of Tiwanaku and Lukurmata.

Structure Layout and Orientation, Materials and Features. At both sites, the main domestic structures were typically grouped into compounds. A residential compound generally consisted of a wall surrounding single and multi-roomed structures that had rectilinear walls connected to outdoor patio areas (Bermann 2003:331 Janusek 2004:137). Structure walls were made of clay bricks or *tapia* (rammed earth, described below) (Janusek 2003a:273, 277). A range of features was found in these domestic areas, including interior and exterior hearths, raised platforms, storage pits and activity areas (Janusek 2003a:269-270, 2004:137; Janusek 2004).

Ritual Aspects of Domestic Structures. Domestic structures were consistently oriented slightly east of north (Janusek 2003a:279). Janusek considers that this consistent alignment, which continues throughout the Middle Horizon, indicates an overarching ideological component expressed in the domestic environment.

Clean rooms, considered to be ritual spaces, have been found at both Tiwanaku and Lukurmata. At the Akapana East excavations located to the east of the ceremonial core at Tiwanaku, Janusek found two rectangular structures distinct from the others. The interior of each was floored with yellow sandy clay and the outside floors had red silty clay. What Janusek considers most striking and distinctive is that the floors were "impeccably clean" (Janusek 2004:111), both inside and outside of the structure. At Lukurmata, another clean space was found with distinctive colored clay floors (Janusek 2004:112).

Layout and Orientation of Domestic Architecture at Piñami

The quantity of architectural evidence that we excavated at Piñami varies greatly by time period. We have very limited Illataco Phase architecture (from Sectors A and B) and none at all from the Early Piñami Phase, but we found extensive architecture from the Late Piñami Phase, primarily in our horizontal excavation unit, Sector C, but also from Sector A-1.

Layout--Illataco Phase. Our only architectural evidence for the Illataco Phase was the base of one wall and a small platform connected to it (Figure 7.1). Due to PLANE techniques, the full context of this wall and platform could not be determined. The wall was rectilinear, constructed from poured mud, *tapia*, without any foundation stones. The length of the wall remnant was approximately 3 meters and the width was approximately 50 cm. The wall was oriented about 10 degrees east of north and the eastern side of the platform abutted the wall. The platform was 1.4 meters wide, at least 1.6 meters long and at least 15 cm high. It was comprised of gravel fill covered with clay. Its upper surface was severely disturbed by later intrusive burials.

Layout--Late Piñami Architecture, Sector C. We found examples of Late Piñami Phase architecture in both Sector C and Sector A-1. The most extensive example is Structure1 in Sector C, which was a multi-room structure at least 8 meters by 10 meters. We were not able to determine the full extent of Structure 1 as it extended past the unit limits to the north and east, and large intrusive colonial era pits cut off the full extent to the west and south. In addition, as pointed out in Chapter 1, due to limits on excavation, we almost certainly did not reach the earliest occupation of this structure.

Structure 1 was a single rectilinear building with multiple agglutinated rooms (Figure 7.2) and a patio area to the south. The alignment of the entire building was

approximately 10 degrees east of north, and this alignment was maintained throughout the various renovations. The building layout and orientation are consistent with a typical Tiwanaku layout, though we found no wall or other structures to indicate Structure 1 was part of a multi-building compound. The building had a number of hearths, platforms, storage pits and specialty features, described below. The hearths themselves may indicate some special feasting or large group functions, but in general the artifact classes present are those of a typical household context.

The walls of Structure 1 were made of *tapia* and were approximately 50 cm wide and almost entirely without foundation stones. Significant adjustments were made to Structure 1 over time. It had at least three major reconstruction episodes during which rooms were expanded or divided and walls removed or added (Figure 7.3). In addition, there were frequent instances of storage pits being added or filled in. Maintenance of floors was evident through small patches of clay in floors or through complete resurfacing.

Layout--Late Piñami Architecture, Sector A-1. Sector A-1 was a small 2 meters by 4 meters unit. One very small room, only 1.5 meters by 1 meter, was almost entirely within the excavation unit (Figure 7.4). The *tapia* construction, structure orientation, wall width and repeated modifications and reflooring episodes found in Sector A-1 are similar to those found in Structure 1 of Sector C.

Orientation. All rectilinear architecture found at Piñami from the Illataco Phase through the Late Piñami Phase was oriented 8 to 15 degrees east of north. This patterned alignment was evident in mortuary architecture as well, strongly indicating a conscious mental map (see Chapter 6). All rectangular or oblong burials were aligned with the long

axis oriented between 10 and 20 degrees east of north. Given that the orientation is so consistent, our one deviant burial (CF-25), which is oriented perpendicular to the norm, is essentially the exception that proves the rule, as even this exception follows the same cardinal direction grid pattern. In summary, the east of north orientation in both domestic and mortuary architecture at Piñami was site-wide during the entire Middle Horizon (Figure 7.5). This east of north orientation found at Piñami is almost identical to that found at Tiwanaku and Lurkurmata (Bermann 1994, 2003), as will be discussed below.

Construction Materials and Techniques at Piñami

Our Piñami excavation yielded rich detail concerning Middle Horizon construction materials and techniques, in particular concerning the use of *tapia* in a manner similar to its use at Tiwanaku.

Tapia. The use of *tapia*, rammed earth or poured mud, was the most common construction method throughout the Middle Horizon at Piñami. *Tapia* was used for domestic walls, which were normally about 50 cm in width and usually straight with approximately 90-degree corners. The mud for the *tapia* consisted of immediately available clays, ranging in color from yellowish to chocolate brown when damp and from light yellow to light brownish gray when dry. The clay mixtures used for *tapia* were frequently, though not always, mixed with grasses. To produce the *tapia* walls, various layers of the mud mixture were laid down and board supports were likely used to form the straight flat walls. (See for example Deagan and Cruxent 2002:99-101.) The mixture used for *tapia* was uneven with lumps of clay often poorly blended. The layers of *tapia*

were of variable thicknesses and were often easily visible due to changes in the colors of the clays (Figure 7.6). At Piñami, this method of construction was in use in the Illataco Phase and continued throughout the Piñami Phase into the Early Late Intermediate.

Only one *tapia* wall at Piñami had foundation stones. The foundations of this wall section, from the Late Piñami Phase, had a double-course alignment of oblong cobblestones (Figure 7.7). For all the other walls at Piñami, little preparation was done before the layers of *tapia* were laid down and there were no foundations. Indeed, the *tapia* construction technique could be quite flexible, allowing for the addition of new walls, even over uneven surfaces such as ashes (Figure 7.8).

Tapia construction is reported in walls in the Middle Formative site of Santa Lucía, with the *tapia* walls placed over stone foundations (Gabelmann 2012b:100). *Tapia* was also possibly used at Sierra Mokho in Formative and Middle Horizon walls, though Döllerer used the term *adobe* (Döllerer 2013). *Tapia* use has been identified as a technique for the construction of walls and buttresses, both with and without foundation stones, at Tiwanaku (Couture and Sampack 2003:212; Janusek 2003b; Rivera Casanovas 2003). *Tapia* walls *without* foundations, similar to those at Piñami, have been found in the Ch'iji Jawira sector of Tiwanaku, well to the east of the ceremonial core (Rivera Casanovas 2003:299).

Adobe Bricks. Formed adobe bricks, composed of clay mixed with straw, were used at Piñami, but in the examples we found, they were used only to form low platforms within rooms or as the edging of, or bases for, hearths. Our team examined walls for evidence of adobe bricks but did not find any instances of them, finding instead only *tapia* as described above. Many of the adobe bricks we did find were in secondary

contexts such as garbage pits or were used in burials to cover the body or as part of the fill for the burial pit (see CF-32 in Appendix 2), so while it is possible that adobe bricks were used for walls in certain instances, we did not find any intact examples.

The adobe bricks we were able to record were not of a uniform size, varying in thickness, width and length. Unbroken adobes ranged in size from 12 cm by 9 cm by 7 cm to 26 cm by 20 cm by 11 cm (Figures 7.9 and 7.10). In form, some were completely rectangular prisms, whereas others had one edge that was rounded. *In situ* adobes in hearths and platforms were all on the smaller end of the range. The largest adobes we excavated were all from secondary contexts.

Postholes. Thirty-one postholes were found, with the majority close to or within the *tapia* structures. The postholes varied in size from 9 cm to 17 cm in diameter. Of the 31 postholes, we have a bimodal distribution, one centering around 9 cm in diameter and the other centering on 12.5 cm in diameter. The depth of the postholes varied considerably, ranging from 11 cm to 40 cm. Many had small stones in the bottom of the hole that may originally have been chinking stones placed around the edges of the post.

Since postholes were most commonly found within and around the *tapia* structures, wooden posts were likely used to hold up roof beams for the interior spaces or to support patio coverings (Figure 7.11). The only clear patio area we were able to excavate, part of Structure 1 in Sector C, had a line of postholes along one side, so it was likely at least partially roofed.

Daub--Clay with Grass Temper. Small bits of low-fired clay with grass temper were frequently found in household contexts. At first we thought these were ceramic sherds, but neither the shape of the fragments nor the consistency of the clay fit an

interpretation as pottery vessels. These grass-tempered clay bits were flat rather than rounded or curved and were not shaped in a way that is consistent with pottery vessels (Figure 7.12). Further, at Piñami grass or straw inclusions were only used in adobe bricks and *tapia*, not in ceramics. The clay's shape and composition (along with its low-fired, brittle quality) suggest that these small fragments were remains of a type of "daub", architectural putty, used to cover walls, fill in cracks or smooth over irregular surfaces. If that was the case, then the pieces were not fired on purpose but rather were likely low-fired due to falling into hearths.

This daub also gives us indirect evidence of the use of cane stalks in architecture at Piñami as a few of these low-fired daub fragments show cylindrical imprints consistent with the size, shape and linear texture of cane (*caña hueca*) (Figure 7.13). Similar cane-imprinted daub fragments associated with kiln structures were found at Santa Lucía, a Middle Formative site (Gabelmann 2005, 2012a:32). At the town of Tarata in the High Valley, I personally observed colonial era cane roof supports still intact and in use. The cane imprints in the colonial daub were consistent with the Middle Horizon Piñami examples we found. So, although we have no *direct* evidence of cane use in walls or roofs at Piñami, the bits of cane-imprinted daub we did find are strong indirect evidence that cane was used in Piñami architecture.

In sum, the most common characteristics of Middle Horizon construction materials and techniques are *tapia* for walls (typically without foundation stones), posts as roof supports, adobe bricks in limited interior contexts, daub (clay with grass) likely used to fill in spaces, and at least occasional use of cane supports in walls or roofs.

Household Features

Key household features at Piñami included platforms, hearths, storage pits, amorphous borrow or refuse pits and ash lenses.

Platforms. We found at least two Middle Horizon platforms that differed in size and construction method. The earlier, Platform 1, was a low platform from the Illataco Phase (Figure 7.1). It was disturbed by later intrusive features, but it was at least 1.4 meters wide, 1.6 meters long and 15 cm high. It abutted the Illataco Phase wall and was constructed using gravel fill covered by a layer of clay.

Platform 2 was from a Late Piñami Phase context and was found in Structure 1 of Sector C. Platform 2 (Figure 7.14) was associated with Hearth D, described below. It was placed in the corner of a room and originally stood at least 25 cm above the room floor. The platform was disturbed by later features, but the size was at least 1.5 meters long by 1 meter in width. The original platform was built up using a series of layers. The lowest layer was comprised of regular adobe bricks (and clay mortar) covered by a thin sand layer. The next layer was adobe bricks of various sizes, followed by a covering of 2 cm of smoothed, hard clay. The complex construction of this platform, together with the fact that it was similar in size and height to raised seats or sleeping platforms found at Tiwanaku residential structures (Janusek 2003a:270) and in the traditional Aymara households (Janusek 2003:270 citing Loza Balsa 1971), makes it likely that the platform had a different function before being used as a hearth.

Hearths. My team found numerous hearths at Piñami, a few from the Illataco Phase and Early Piñami Phase and most from the Late Piñami Phase. The simplest hearths were made in small depressions that ranged in size from 30 cm to 60 cm in

interior diameter and were lined with ceramic fragments and lumps of adobe. More complex hearths used adobe to form edgings for the hearths. For example, Hearth A consisted of adobe placed in an oval around the fire area (Figure 7.15). Blocks of clay were in the center of the hearth, presumably to support vessels placed in the fire. Hearth A was 70 cm by 60 cm (.33 m^2) with an interior space of approximately 50 cm by 30 cm (.12 m^2). Hearth A was remodeled repeatedly, with adobes and clay added to the edging of the hearth as ashes built up. (Our Quechua workers constructed a traditional Quechua hearth that shows how an adobe mud hearth could be formed and could support multiple cooking pots. See Figure 7.16).

Late Piñami Phase Structure 1 had a variety of hearths, both interior and exterior, including three large hearths (Hearths B, C and D) as well as a number of small hearths similar to Hearth A. Hearth B was from the earliest occupation of Structure 1 that we were able to excavate (Figure 7.3, left). Hearths A, C and D were contemporaneous from a later occupation of Structure 1 (Figure 7.3, right).

Hearth B was a large exterior hearth bounded to the north by Structure 1 and to the east and west by lines of low adobe blocks; the southern limits of the hearth were destroyed by a large intrusive pit. The hearth area had a burned area at least 100 cm by 80 cm (~.7 m^2) and a dense ash buildup at least 20 cm deep and covering an area of ~2 m^2 (Figure 7.17). Structure 1 was expanded over time and covered over the northern section of Hearth B. The southern section, still on the exterior of the structure, continued to be used as a hearth. In the final phase of Structure 1, this large exterior hearth was covered over entirely by a layer of clay to form the floor of a patio area.

Hearth C was a large hearth located directly on the floor of an interior room of Structure 1. It was 70 cm wide by 95 cm long (.67 m^2) with no built-up rim boundary. Layers of large flat utilitarian sherds were placed on the floor surface to make a base for the hearth. As the hearth was used and ashes built up, new layers of utilitarian sherds were placed on top of the ashes (Figure 7.18).

Hearth D is associated with Platform 2, which may originally have had a different function, as mentioned above. Whatever its original purpose, the platform was used extensively as a hearth, as there was a large area, up to 1.3 meters in length by at least 70 cm in width, with burned earth and ashes. There was also a densely burned area within the larger hearth. Fire from hearth use destroyed the underlying adobes of the platform and ashes built up. Hearth D was repaired multiple times by using pieces of adobe of varying sizes that were covered each time with a new layer of clay. In its final use the platform was covered with a dense layer of ash approximately 20 cm thick. Further, it is noteworthy that Hearth D was contemporaneous and back-to-back with Hearth A (Figure 7.19).

It is striking to find multiple large hearths at Piñami with areas of approximately .7 m^2 or more. For comparison, the Middle Horizon hearths Bermann found at Lukurmata ranged from .13 m^2 to .28 m^2, with one larger hearth measuring .52 m^2 (Bermann 2003:332). Further, Hearths C and D and the smaller Hearth A were all contemporaneous and located within the same structure. The presence of large hearths, especially those that were contemporaneous, may indicate large-scale feasting.

Storage Pits. My team found large storage pits at Piñami. They measured 1 meter to 2 meters in depth and included bell-shaped pits and cylindrical pits (Figures 7.20 and

7.21). These pits were likely initially storage, though the majority finished their use-life as garbage pits. Storage pits will be covered in depth later in this chapter in a discussion of the evidence for intensification of food production.

Amorphous Refuse, Borrow Pits and Ash Lenses. Large amorphous refuse pits or "borrow" pits (from which material had been scavenged for use elsewhere) were present from the Illataco Phase through the Late Piñami Phase (Figure 7.22). These pits were found outside of structures and varied in size and shape but tended to be round to oval. They were generally shallower than storage pits and typically contained large amounts of ash, food and other debris.

Ash lenses are horizontal concentrations of ash that are built up on floors or in shallow depressions. These are mostly amorphous and vary considerably in size. As mentioned above, ash deposits on floors were frequently just left in place and covered in a subsequent reflooring event.

Ritual Spaces

At Piñami we found clean rooms, burials in domestic space and at least one dedicatory offering.

Clean Room. The Late Piñami Phase Structure 1 contained a room that was unusual in its distinctive floor color and thickness and unusual in that it was the only room that was clean of artifacts or debris. As noted above, clean rooms with no surface artifacts and with distinctly colored clay floors have also been found at both Tiwanaku and Lukurmata and are considered ceremonial spaces (Janusek 2004:110–112). Our

Structure 1 room had similar characteristics suggestive of ritual significance. The room was at least 2 meters by 4 meters, though we do not know the full dimensions since it extended outside the excavation unit boundaries. In addition to being clean of debris, it had an unusually thick clay floor (averaging 3 cm in thickness) with a particularly smooth surface. The floor used clay that was pale yellow and lighter in color than that of any other floors found at the site (Figure 7.23). This room was refloored once by placing the same type of thick pale yellow clay over a thin layer of ashes and carbon. Although ash deposits are frequently found between reflooring events, the layer of ashes between the clean room floors is unusual for its even distribution of ashes and for the presence of small chunks of carbon.

Burials in Domestic Spaces. As detailed in the prior chapter, the majority of burials at Piñami were clustered together in what can be considered cemetery areas. These burials were close to existing habitation areas but not actually part of the living domestic space. Two of the burials from Late Piñami Phase Structure 1, however, were purposely placed in domestic space. One was a deviant burial (CF-25), possibly associated with the clean room, since the chamber for CF-25 was constructed directly under the fill beneath the floor of the clean room. The other burial in domestic space (CF-32) was a burial under a patio.

Animal Dedicatory Offering. While we have several instances of camelid offerings associated with human burials, we found only one example of a non-mortuary camelid offering. The offering was comprised of the right half of a lower jaw of a camelid. This bone was placed in a small shallow pit within a larger pit. The larger pit was long and narrow, about two meters in length, 30 cm wide and 30 cm deep (at the

deepest section), forming a thin canoe-shaped pit. This pit ran directly below wall R-32 of Structure 1. In the center of the canoe-shaped pit was the smaller oval pit, about 40 cm in diameter and 15 cm deep, that contained the camelid jawbone (Figure 7.24)[1]. Both the pits had been filled with loose dirt before the wall was built on top of them. Though this is the only example we found of a camelid dedicatory offering at Piñami, such offerings were not uncommon in the Andes. (See Goldstein 2005:215-216 for examples at Moquegua and elsewhere in the Andes.)

Household Activities and Tool Use

Beyond the architectural structures and features just described, our excavations yielded many tools and other artifacts that give insight into the activities of daily life of the Piñami people during the Middle Horizon. Furthermore, some of these artifacts show clear Tiwanaku influence; that is, they are artifacts that either are highly typical of Tiwanaku sites or show transition to patterns that more fully resemble Tiwanaku. In the following section, I examine utilitarian ceramics (cooking and storage vessels) and household tools and ritual items, highlighting two particular findings: (1) certain artifacts, such as ritual snuff paraphernalia, are striking in their similarity to what has been found at Tiwanaku, and (2) an apparent change in cooking method suggests strong Tiwanaku influence in the Central Valley.

Utilitarian Ceramics

Changes in ceramic fineware, as we saw in Chapter 4, were clearly indicative of Tiwanaku influence. Utilitarian vessels tend to be more conservative than fineware and tend to change less in contact situations. For that reason, any changes that we do see are particularly noteworthy. Middle Horizon cooking pots and storage vessels at Piñami show both signs of Tiwanaku influence and a marked local continuity. On the one hand, production methods for utilitarian ware--including the type of temper, firing, paste, porosity and surface treatment--evidence greater continuity with the Late Formative Sauces or Tupuraya styles than similarity with Tiwanaku (this continuity contrasts with the considerable changes seen in *fineware* production methods). On the other hand, we do see clear Tiwanaku influence in the changes in form and decoration of utilitarian vessels and in the evidence those vessels yield of a change in cooking method. The following three sections examine utilitarian vessel form and surface treatment, production methods of utilitarian ware and cooking methods as evidenced by utilitarian ware.

Utilitarian Vessel Forms. Utilitarian vessel forms evidence clear Tiwanaku influence together with some local continuity. Some local forms, such as the amphora-shaped storage vessel used in Sauces and Tupuraya, are abandoned. Typical Tiwanaku forms, such as the pear-shaped *olla,* are added. The key storage and cooking vessels we found were *tinajas*, *vasijas*, *ollas* and *ollitas*.

--*Storage Vessels/Tinajas. Tinajas*, vessels used for storage of liquid or grains or for fermentation, were common at Piñami, though body sherds of storage vessels were often hard to distinguish from body sherds of cooking vessels due to similarities in the

temper and paste. *Tinajas* had rim diameters that ranged from 15 cm to 24 cm and came in a variety of shapes, from heart-shaped with highly accentuated shoulders and a small base to more oval-shaped globular forms. Handles, if present, were usually in pairs, placed vertically on the lower mid-section of the body or horizontally on the shoulders (Figure 7.25).

--*Utilitarian Vasijas*. *Vasijas*, small undecorated flasks, were common in domestic and mortuary contexts. They were either smoothed or roughly burnished and typically had one small vertical handle at the neck (Figure 7.26). They ranged in size from 8 cm to 12 cm in height and 5 cm to 11 cm in diameter at the rim. This form is consistent with Tiwanaku utilitarian *vasija* forms (Janusek 2003b:67).

--*Cooking Vessels/Ollas and Ollitas.* The Middle Horizon cooking vessels, *ollas*, came in a range of sizes and shapes at Piñami (Figure 7.27). While some of the Middle Horizon cooking vessels are similar in form to local Formative ones, the majority show a departure, especially in the new use of vertical handles on cooking pots, which were uncommon in Cochabamba Formative styles (Céspedes Paz et al. 1994; Gabelmann 2005, 2008).

Most of the Middle Horizon *ollas* at Piñami were globular or pear-shaped, resembling those at Tiwanaku (Janusek 2003b:57-58). For Tiwanaku, Janusek reports that globular *ollas* had rim diameters of 12 cm to 20 cm and tall pear-shaped *ollas* had rim diameters of 10 cm to 18 cm (Janusek 2003b:57-58). At Piñami, the globular *ollas* ranged from 11 cm to 21 cm in rim diameter and pear-shaped *ollas* ranged from 16 cm to 25 cm. *Olla* fragments at Piñami often had carbon encrusted on the exterior, the significance of which will be discussed below.

Small cooking vessels, *ollitas,* were also common at Piñami. *Ollitas* ranged in rim diameter from 4 cm to 10 cm (Figure 7.28). These vessels have been reported in other Tiwanaku sites and were common as burial offerings at Moquegua (Goldstein 2005:251). At Piñami, small *ollitas* were found in both domestic areas and mortuary contexts. In fact, *ollitas* were the most common offering vessel type found in Late Piñami Group burials. *Ollita* fragments in both domestic and mortuary contexts had carbon on the exterior, showing they had been used in or near a fire.

The main non-Tiwanaku Middle Horizon cooking vessel form found at Piñami was an open, wide-mouth *olla*. These wide-mouth *ollas* typically ranged from 21 cm to 31 cm in rim diameter with some very large vessels reaching 43 cm. They are taller than they are wide and tend to have small bases. Most have vertical rim-to-shoulder handles, though occasionally there are horizontal shoulder handles. The widest part is in the middle of the vessel. Rims tends to flare at the rim edge (i.e., they have much shorter necks than regular *ollas*) and the flaring is not pronounced (Figure 7.29). Wide-mouth *ollas* were present in the Formative in Cochabamba (Döllerer 2013; Gabelmann 2008). Similar wide-mouth forms are used today in Cochabamba for *chicha* brewing, which might be the purpose the vessel served in the past as well.

Production Methods. Middle Horizon storage and cooking vessels had smoothed, unburnished or only roughly burnished surfaces, and most were either undecorated or covered with a thin red or cream wash. Very few utilitarian vessels had painted designs. Those few that did were limited to storage vessels and were decorated in black with the most common motif being volutes or wavy lines. Painting on utilitarian vessels was done using wide strokes, and the designs were not carefully executed, in contrast with the

precise and symmetrical execution of imported Tiwanaku or CVCT fineware (Figure 7.30).

Utilitarian vessels at Piñami differ from those at Tiwanaku in that it is much easier to distinguish between storage pots and cooking pots at Tiwanaku than at Piñami. At Tiwanaku, storage and cooking pots had noteworthy differences in hardness, porosity and wall thickness; storage vessels used denser paste that was high-fired with few inclusions, and cooking vessels used more porous paste that had a greater quantity of temper and lower firing temperature (Janusek 2003b:88). At Piñami, both cooking and storage vessels tended to be low-fired and somewhat porous. They used similar temper types. The most typical type was red and/or gray shale; other temper types included gravel and sand or ground sherd. The high degree of similarity made distinguishing between body sherds of cooking vessels and those of storage vessels quite problematic at Piñami, to say the least.

A diagnostic feature of the temper used in utilitarian vessels at Piñami is the distinctiveness of the speckled appearance produced by the shale temper. The shale temper used pieces up to 5 mm in size that were easily visible on the surface. In addition, the majority of vessels with shale temper used two colors of shale, red and gray, that produced a striking multi-colored speckled surface that is still easily visible even in cases where a thin wash has been applied to the surface (Figures 7.31 and 7.32). Shale for temper was locally accessible as outcrops of red and gray shale are found in the Cochabamba valleys. Janusek reports that Tiwanaku utilitarian ware generally used fine- to medium-grain feldspar and mica instead of shale (Janusek 2003b:58-60).

The Piñami pattern for temper in cooking and storage vessels, particularly with respect to the shale temper, is likely an adaptation of Formative methods of production. In particular, the Late Formative styles Sauces and Tupuraya used large pieces of shale temper, though due to paste color, thicker slip on the surface and reduction firing, the shale in Formative Sauces and Tupuraya was less visible on the surface than was the shale temper of the Middle Horizon utilitarian vessels. Thus, the Middle Horizon temper for cooking and storage vessels reflected more local than Tiwanaku traits.

Cooking Methods. Surprisingly, cooking *methods* appear to have changed during the Middle Horizon. None of the cooking vessels recovered at Quillacollo from the Middle or Late Formative had carbon on the exterior, nor did any from Formative Piñami, though in the latter case we have few examples of cooking vessels from which to judge. This lack of carbon suggests that in the Formative, Cochabamba cooking was typically not done over a fire in a ceramic vessel but more likely was accomplished by adding heated rocks to the cooking vessel or basket, a practice found in other parts of the Old and New Worlds (Atalay and Hastorf 2006).

In sharp contrast, carbon was commonly found on the exterior of utilitarian vessels during the Middle Horizon at both Quillacollo and Piñami (Figure 7.33). Consistent recording of carbon was not done at Quillacollo, but at Piñami, where we have a more substantial sample, 30% of the *total* utilitarian sherds have carbon on the exterior. The percentage on cookware alone is presumably much higher; a reasonable estimate would be 50% to 80%. In any event, the high percentage of sherds with carbon on the exterior indicates that cooking took place in or very near an open flame. This presence of carbon is consistent with patterns at Tiwanaku. There, 70% to 90% of Middle Horizon

cooking vessel sherds had carbon, indicating cooking over a fire was common (Janusek 2003b:58). The apparent change from cooking with heated rocks to the substantial use of a highland method of cooking close to an open flame is a dramatic change that suggests strong Tiwanaku influence on Central Valley cooking practices.

Other Artifacts

A variety of other artifact types point to domestic or ritual activities at Piñami, including some that are particularly noteworthy as evidence of Tiwanaku culture. I will first present the artifacts that have been considered diagnostic of Tiwanaku occupations—*trompos*, mandible tools and snuff paraphernalia—and then present evidence of other artifact classes that express household activities.

Trompos. At Piñami we found eighteen examples of stone *trompos* (Figure 7.34), small egg-shaped or top-shaped stones. These ranged in size from 3 cm to 5.5 cm in length and were found inside and outside of structures and within garbage pits, starting in the Illataco/Early Piñami Phase and continuing through the Late Piñami Phase. While the purpose of these stone items remains elusive, they are often considered diagnostic of Tiwanaku sites (Bermann 2003:335-336; Janusek 2003a:275). At Tiwanaku itself, they are considered part of the daily domestic tools at the household level and are closely associated with Tiwanaku IV and V occupations (Bermann 1990, 1994, 2003; Janusek 1994, 2003a, 2004). *Trompos* at Piñami continued into the Late Intermediate Period.

Mandible Tools. Camelid mandible tools are another tool type that has been considered characteristic of Tiwanaku occupations and is typically found in residential

contexts (Bermann 1994:188–189, 2003:335-336; Goldstein 2005:199–200; Janusek 2003a:275; Webster and Janusek 2003:357). Tiwanaku-style camelid scrapers were formed by removing the tooth portion of the lower jaw and using the bottom edge of the corner of the jawbone as the scraping surface (the base of the ascending ramus) (Figure 7.35, top). At Tiwanaku, these tools were not found in contexts prior to Tiwanaku IV and disappeared by the end of Tiwanaku V (Webster and Janusek 2003:357), so they are considered to be particularly diagnostic of Tiwanaku state occupations.

At Piñami, camelid mandible scrapers were frequently found, dating from as early as the Illataco Phase and continuing through the Late Piñami Phase in both household and midden contexts. The earlier examples (corresponding to the Illataco and Early Piñami Phase contexts) were all similar to those found at Tiwanaku. However, there is greater variation in mandible scrapers from the Late Piñami Phase. In those contexts we not only found the typical scrapers (which used the bottom edge of the corner of the jawbone) but also found mandible scrapers that used the base of the tooth portion and other variations for the scraping surface that are not reported for Tiwanaku (Figure 7.35, bottom). Interestingly, mandible scrapers disappeared at Tiwanaku by the Late Intermediate Period (Webster and Janusek 2003, Goldstein 2005), but at Piñami not only the typical Tiwanaku scraper type but also the variations that developed in the Late Piñami Phase continued into the Late Intermediate Period.

Ritual Snuff Paraphernalia. Implements related to hallucinogenic snuff rituals, including small spoons, spatulas, tubes and *rapé* tablets made of wood, bone or stone are characteristic of Tiwanaku Middle Horizon occupations in the highlands and throughout the peripheries (Webster and Janusek 2003:357-358, citing Goldstein 1989 and Torres

1985). These ritual tools are considered an integral part of Tiwanaku state religion and indicative of the spread of Tiwanaku culture (Bermann 1994:143; Browman 1978:336-337; Goldstein 2005:74-75; Webster and Janusek 2003:357-358).

In our Piñami excavations, we found parts of various bone snuff spoons and spatulas in domestic and midden contexts (Figure 7.36). None were found in mortuary contexts. Temporally, these artifacts correspond to the Illataco Phase through the Late Piñami Phase. The snuff paraphernalia included a few pyro-engraved bone spatulas and parts of polished bone snuff spoons, including one completely intact and well-polished spoon that had a minutely detailed carved clenched fist on the end of the handle (Figure 7.37). Céspedes Paz also reports a variety of snuff paraphernalia from his 1988 Piñami excavations. In addition to similar bone spoons and spatulas, he found a bone tube engraved with detailed zoomorphic iconography in a mortuary context (Céspedes Paz 2000:9).

Bone Flutes. Also present were three bone flutes made of camelid long bones, each with a single row of holes (Figure 7.38); they were similar to those found at Tiwanaku but not considered a type particularly diagnostic of Tiwanaku (Webster and Janusek 2003:358). We also found a few short sections of bone tubes that appeared to be cut off. Janusek found similar short sections of bone tubes at Tiwanaku and considered them to be evidence of tuning the flutes (Webster and Janusek 2003:358).

Bone Weaving and Sewing Tools. Numerous bone weaving tools and bone awls were found in domestic and midden contexts throughout the Middle Horizon. None were found as grave offerings. These weaving and sewing tools included *wichuñas*, needles, and awls (Figure 7.39), tools typical throughout the Andes both before and after

Tiwanaku.[2] Many of these weaving tools were highly polished and some of them were decorated with carvings, marking them as frequently used and prized possessions.

Spindle Whorls. Given the quantity of weaving tools present, we found surprisingly few spindle whorls, objects necessary for the transformation of wool and cotton into fibers. The small number of spindle whorls found suggests that either fiber production occurred in another area or that most spindle whorls were likely made of a material, such as wood, that did not preserve. The few spindle whorls we do have were made either of stone or ceramic (Figure 7.40). The ceramic examples were made out of sherds from utilitarian vessels and ground to a round shape. A few of the round ceramic disks had no holes in them. These may have been blanks for spindle whorls or they may have had some other purpose.

Food Processing Tools. Grinding stones (*metates*) and hand stones (*manos)* were the main food processing items we found (Figure 7.41). The grinding stones typically had been well-used and were highly polished. None were found in their original context. Broken ones were found in middens and used in tomb walls. One was placed upside down (polished side down) at the top of a storage pit.

Bone Saws. Bone saws made out of camelid scapula bones were frequently found from the Early to Late Piñami Phases. These were formed by making small consecutive v-shaped cuts along one of the long edges of the scapula, resulting in a saw tooth edge (Figure 7.42). Over time, these teeth became rounded and polished. These types of saws were reportedly used by Native Americans in California to cut tule reeds, important for making boats, houses and articles of clothing (Coyote Hills Regional Park 2008; Margolin and Harney 1978). While I have not conducted microanalysis of the bone saws we found

at Piñami, I have performed replication experiments. Using deer scapulas, I reconstructed multiple examples of this type of saw tool using stone flakes to make the "v" indentations on the edge of the scapula to form the teeth. When I tested the replicated saws, they could cut through only very thin pieces of woody material, but they were very effective in cutting through thick grasses and reeds such as tule reeds. This type of bone saw could potentially be effective in cutting and harvesting corn stalks.

Copper Implements. Metal implements were rare at Piñami. The most common metal found was copper, most often in the form of long pins (likely *tupus* for fastening shawls) or small ornaments, possibly for clothing (Figure 7.43). Copper implements were found primarily in midden or domestic contexts and in only one burial context (CF-36).

*Projectile Point*s. Projectile points at Piñami were rare during the Middle Horizon and only slightly more common during the Late Intermediate. The Middle Horizon stone points, typically made of chert or quartzite, were triangular (Figure 7.44). Some had stems but without the pronounced barb seen in the "Tiwanaku" type projectile points (Giesso 2003:378). We also found camelid bone pieces shaped into the form of projectile points (Figure 7.45).

Stone Axes. We found only a few examples of stone axes or large knives, all from the Late Piñami Phase. All were broken with the remaining cutting edge ranging from 4 cm to 9 cm. The cutting edge was ground on both sides for a highly symmetric straight edge (Figure 7.46).

In sum, we found a variety of domestic or ritual artifacts. Those showing Tiwanaku influence most clearly were the hallucinogenic snuff paraphernalia, mandible tools and stone *trompo*s.

Food Sources and Evidence of Intensification of Production

Along with evidence about architecture and tools in households, our excavations yielded important data about food sources. Faunal analysis from Piñami identified a broad range of animal food sources, including camelids, guinea pigs (*cuy*) and other rodents, deer, fish, birds, and bird eggs (Figure 7.47). Analysis also indicates imports, such as larger river fish from the tropical lowlands to the east. A comprehensive report of findings is outside the limits of this dissertation, but I would like to draw particular attention to the evidence of the two dominant food sources, maize and camelids, and to the evidence of storage facilities. Our Piñami findings show a marked dependence on and probable intensification of production of maize in the Central Valley during the Middle Horizon. We also found evidence of a pronounced presence of camelids, animals which would be important for transporting grain over a long distance. Finally, our evidence points to an increase in storage capacity over time that in turn suggests intensification of production. Overall, the Piñami evidence points to a surplus production of goods desired by and likely exported to Tiwanaku.

Importance of Maize

As previously discussed, access to maize has long been considered a reason for Tiwanaku expansion into the Cochabamba region. Our Piñami evidence supports this hypothesis in that it proves the dominance of maize in local subsistence and supports probable intensification of maize production during the Middle Horizon.[3]

Our examination of food remains in hearths and middens at Piñami showed maize was the dominant macro-botanical throughout the Middle Horizon (Figure 7.48). Isotope analyses of human remains from Middle Horizon Piñami burials by Kellner show that maize comprised more than 80% of the diet at Piñami throughout the Middle Horizon.[4] In addition, Kellner reports:

> The individuals buried at Cochabamba consumed maize, other C_4 plants, and /or CAM plants for the vast majority of their diet. Compared with the contemporaneous agriculturists from the Wari secondary city of Conchopata (Finucane et al. 2006), the individuals at Cochabamba exhibit $\delta^{13}C$ values that are approximately 2‰ more positive than Conchopata…. Based on [this and other] comparisons, Cochabamba individuals consumed a diet that almost exclusively centered on C_4 plants, with maize as a main staple. (Kellner 2010:3)

This high percentage is greater than that found at the other key Tiwanaku maize-growing periphery, Moquegua. There, the estimated proportion of maize in the diet ranged from 46% to 76% (Goldstein 2005:220).

Piñami percentages also exceed the percentages of maize in the diet found in the maize-growing populations of the pre-Columbian American Southwest. Keller notes "Cochabamba individuals … exhibit some of the most positive $\delta^{13}C$ values of any populations thus studied, and are similar to [the values of individuals] found at Pecos Pueblo, southwestern U.S. maize agriculturists who likely consumed maize as their dietary staple and meat, such as bison and turkey, that were fed maize or ate C_4 grasses" (Kellner 2010:5-6). The marked dependence on maize seen in the Middle Horizon in

Cochabamba has as yet no documented equivalent in the Formative. At the Early Formative site of Yuroq Molino in the Mizque Valley, the macro-botanical specimens were almost entirely *tarwi*, and maize was only inferred from the presence of some tools *possibly* used to remove kernels from the cobs (Pereira Herrera et al. 2001:173). Analysis of flotation samples from Middle Formative contexts at Santa Lucía by Terceros Cespedes will greatly add to the discussion of whether maize was present in the Formative.

The high level of maize found at Piñami does appear to indicate a substantive increase in local maize consumption, certainly from the Early and Middle Formative, and raises the question of whether Cochabamba produced surplus maize for export. Comparative analysis of Tiwanaku maize by Hastorf and colleagues (Hastorf et al. 2006) supports the theory of exported surplus. As discussed in Chapter 5, the researchers found that the Piñami maize variety was consistent with one of the three varieties found at the Tiwanaku capital, and the maize from Moquegua was consistent with another. The researchers concluded that maize from Cochabamba and Moquegua was likely to have been exported to the highlands. If in fact there was a significant exportation of maize to the highlands, we might reasonably expect to find evidence of transportation and storage. The next two sections address the indirect evidence for this: increasing camelids and increasing storage facilities over time during the Middle Horizon.

Camelids

It is clear that camelids were plentiful at Piñami since camelid remains constituted the majority of the faunal remains. While Minimum Number of Individual (MNI) determinations have yet to be conducted for the Piñami sample, the high camelid bone counts suggest a similar percentage to those found at Tiwanaku, Lukurmata and other highland sites. At those sites, during Tiwanaku IV and Tiwanaku V, camelids were by far the dominant species, with percentages averaging in the high 70s for Minimum Number of Individuals of all taxa of all contexts (Webster and Janusek 2003:345-346).

The majority of the camelid bones found at Piñami were fragmented. Fragmented camelid bones, likely broken to obtain fat and marrow, were commonly found at Tiwanaku during the Formative and Tiwanaku periods (Webster and Janusek 2003:355-356). Up to 25% of camelid bones found at Piñami showed signs of being burned or carbonized (Figure 7.48). Burned and carbonized bones were common at Tiwanaku, likely a result of household cleanup (Webster and Janusek 2003:356).

Comparative evidence from the Cochabamba Formative is limited. While it is clear that camelids were used as food during the Formative, evidence suggests hunting was more important than herding at Early and Middle Formative sites since undomesticated animals such as deer were higher in frequency than camelids (Brockington et al. 1995; Döllerer 2013; Gabelmann 2005; Pereira Herrera et al. 2001). For the Middle Horizon, the high percentage of camelids in faunal remains points to increased camelid herding. Further, an increase in camelids could also be related to the use of camelids for caravan transports.

Increased Storage Capacity

Increased storage capacity is a common indicator of intensified production. At Tiwanaku, increased storage was evidenced by larger and more frequent storage pits—either bell-shaped or cylindrical—in domestic spaces (Bermann 2003:333; Janusek 2003a:275). For example, at Lukurmata the size of storage features more than doubled in capacity from Late Formative and Early Tiwanaku IV occupations to Late Tiwanaku IV (Bermann 2003:332-333).

At Piñami, a variety of bell-shaped and cylindrical pits was present throughout the Middle Horizon (see Figure 7.20). These pits were likely used for storage, though almost all of them ended their use lives as refuse pits. As at Lukurmata, the frequency and size of household storage pits do appear to increase over time. We excavated a few bell-shaped and cylindrical pits from the Early Piñami Phase. These were typically no more than 70 cm deep. By the Late Piñami Phase, storage pits were more frequent and larger, reaching 1.5 m deep for bell-shaped pits and up to 2 m deep and 1 m in diameter for cylindrical pits. It is difficult to determine the increase in storage capacity over time since significantly more Late Piñami contexts were excavated than earlier contexts. Review of the large profiles left by the previous PLANE salvage excavations at Piñami (Sectors A and B), however, supports a likely increase in household storage pits over time. In the profiles, there were at least six large bell-shaped pits from Late Piñami contexts, compared with two or three smaller pits from the Early Piñami occupations.

In sum, the primacy of maize as a macro-botanical during the Middle Horizon at Piñami and the high percentage of maize in the Piñami diet, particularly in light of the absence of maize findings during the Early and Middle Formative, suggest a transition to

and increasing dominance of a maize economy in Cochabamba during the Middle Horizon. In addition, the findings of Hastorf and collegues (2006) that the Piñami maize variety was one of the main varieties found at Tiwanaku, the increase in household storage capacity during the Middle Horizon, and the accessibility to camelids that could be used for maize transport are all consistent with the hypothesis that Cochabamba produced a surplus of maize that was exported to Tiwanaku and that this connection increased over time.

Discussion

The varied evidence presented in this chapter fills out the image of Middle Horizon Piñami presented in the previous chapters on ceramics and burials. Out of the wide range of findings concerning architecture and daily life in Piñami, I'd like to highlight four important issues.

First is the evidence of intensification of food production. Our evidence concerning food makes it clear that maize is by far the dominant macro-botanical at Piñami. Evidence for surplus production of maize for export is suggestive rather than conclusive. We have yet to find, for instance, any non-household storage centers. However, the increase in household storage capacity shown by larger and more numerous storage pits together with the presence of Piñami varieties of maize at Tiwanaku are highly supportive of the argument that there was excess production for exportation. The

increasing importance of camelids is also supportive of an exportation model since camelid caravans would be important for transporting the grain the long distance to the capital.

Theories have been put forward that the desire for maize was the impetus for Tiwanaku expansion to Moquegua and other maize growing regions such as Cochabamba (Goldstein 2003, 2005; Stanish 2003, 2013). Goldstein, for instance, proposed that Tiwanaku expansion was driven by the high value of maize chicha (the "chicha revolution" referred to in Chapter 5). Stanish theorizes that Tiwanaku was strategic in investing in non-contiguous peripheral regions that have resources, such as maize, particularly desired by Tiwanaku. Overall, I feel the evidence from Piñami supports the tying of Tiwanaku expansion to Cochabamba maize and also supports the argument for strong ongoing economic ties between the regions.

Second, I'd like to draw attention to the possible implications of extra-large hearths and the Structure 1 clean room. Typically, Tiwanaku domestic hearths are less than half a meter in diameter and usually have a surrounding rim of adobes, stones and ceramic fragments (Bermann 1994, 2003:332; Janusek 2003a:270). While the majority of the hearths at Piñami are consistent with these characteristics, the three larger hearths of Structure 1, two indoor and one outdoor, are all greater than a meter in diameter and have large flat surfaces. I find the size and construction traits noteworthy. The large diameters, the flat surfaces and the type of edges made the hearths suitable for roasting or large-scale cooking, such as for feasting events. The two large indoor hearths were contemporaneous (the outdoor hearth was from an earlier occupation). The presence of two large hearths in the same household indicates the capacity for large group feasting.

The evidence of one household structure is insufficient for determining the frequency of large hearths at Piñami overall, but the ability of one household to provide hospitality on a large scale suggests to me a person or family of higher status with obligations of generosity. (See Janusek 2003a:267 for discussion of reciprocal obligations of community leaders in the Andes.) Further, this structure also contained a clean room, a circumstance supporting the idea that this household had ritual obligations in addition to feasting, again suggesting a higher status household.

Third, I have shown throughout this chapter similarities between the material culture of Piñami and that of Tiwanaku. In some cases, Tiwanaku influence is evident. Aspects of utilitarian ceramics, notably changes in vessel form and cooking technology, show clear Tiwanaku influence. Hallucinogenic snuff paraphernalia such as snuff spoons, tubes and spatulas, especially those with Tiwanaku iconography, offer another obvious example of influence. This snuff paraphernalia is considered diagnostic of Tiwanaku occupations, as are stone *trompos* and mandible scrapers (Bermann 1994; Goldstein 2005; Webster and Janusek 2003); examples of all three are present throughout the Middle Horizon at Piñami.

In other cases, similarities between artifacts from Piñami and those from Tiwanaku are striking but not necessarily indicative of influence in one direction or the other. For example, household layout and wall construction techniques at Piñami closely resemble those of Tiwanaku, but it is possible that these architectural developments appeared in the Central Valley prior to Tiwanaku's arrival. Further, *tapia* for wall construction is used at Piñami and Tiwanaku but is also present in the Cochabamba High Valley during the Middle Formative (Gabelmann 2012b).

Finally, I want to highlight the importance of the 8 to 15 degree east of north orientation of architectural layout and burials and the ideology that orientation embodies. We saw at Piñami that both domestic architecture and oval or rectangular burials were oriented in the same way, slightly east of north, throughout the Middle Horizon. This orientation aligns with patterns at Tiwanaku. Although we cannot identify the similarity of orientation in Piñami and at Tiwanaku as a case of direct influence, I nonetheless find this completely consistent orientation noteworthy and revealing. Janusek reports that outside the ceremonial core around Tiwanaku, domestic architecture had a regular directional orientation of 6 to 8 degrees east of north (Janusek 2004:150-151), with slightly more variable orientation, up to 12 degrees east of north, at the secondary site of Lukurmata (Janusek 2004:177). Janusek posits that this consistent directional orientation of domestic architecture implies a "formal urban design that reified a single . . . spatial cosmology" (Janusek 2004:150) shared throughout the Titicaca basin and of such importance that he considers it "elemental to Tiwanaku cultural hegemony" (Janusek 2004:187). At Piñami we can make an even stronger case for inferring a shared cosmology, since not only is the architecture on the east of north alignment, but the burials are as well. The presence of a consistent Middle Horizon orientation at Piñami suggests that Piñami architecture shared essential cosmology with Tiwanaku and regularly renewed this shared cosmology by the construction of new buildings and burials over hundreds of years.

Conclusion

The goal of this chapter has been twofold: to give a picture of activities and life patterns at Piñami during the Middle Horizon and to look for evidence of Tiwanaku influence in the Central Valley. As to life patterns, we see the people of Piñami were large consumers of maize and camelids, who supplemented their diet with hunting and gathering and through trade with other regions. Artifacts have shown how Piñami people constructed their homes, the tools they used for daily tasks, the vessels they used to prepare and store their food, and aspects of the rituals they practiced.

The life patterns at Piñami looked very much like those at, and in some cases were clearly influenced by, Tiwanaku. The Piñami people daily ate and drank from vessels with clear Tiwanaku iconography. They used Tiwanaku-related snuff spoons, mandible scrapers and *trompos*. They used cooking vessels, and cooking methods similar to those at Tiwanaku, and their houses and burials were laid out in the same orientation, creating a similar village experience.

At the same time, as we have seen in the cases of ceramics and burials, household artifacts also reveal a continuity of local practice. The integration of household artifact evidence into our earlier ceramic and burial evidence creates a fuller picture of Piñami life—a life similar to that of the larger Tiwanaku sphere in terms of day-to-day tasks, a shared economy, a social identity and an essential cosmology.

[1] The oval pit has a length of 40 cm. (This is longer than the width of the canoe-shaped pit, but the oval pit was placed at an angle.)

[2] Bone weaving tools are used even to the present day. Children who have come to expositions of Piñami materials have commented that their grandmothers still use identical items.

[3] During the Middle Horizon, maize increased substantially in distribution, especially at Tiwanaku, where maize was the second most important domestic edible crop found (Wright et al. 2003:390). This finding is striking considering the high-elevation environment and suggests "substantial long-distance import" of maize (Wright et al. 2003:402). In addition, isotopic evidence at Tiwanaku confirms maize-related dietary change in the Middle Horizon. Goldstein notes that isotope analysis from Moquegua burials shows that pre-Tiwanaku people had much less maize in their diet than Tiwanaku-period populations (Goldstein 2003). Isotopic analysis by Berryman, Biom, and Tykot (2007) of burial populations from Tiwanaku, Khonko Wankane, and Lukurmata confirms that during the Late Formative people had limited access to maize, but during the Middle Horizon the amount of maize in the diet increased substantially for some individuals (whose diet was up to 70% maize) and remained similar to Formative levels in the others. While the pattern is not completely clear-cut in all sectors, some of the highest levels of dietary maize were found in individual burials in elite sectors of Tiwanaku, indicating some elite control of maize. In the Late Intermediate Period, levels of dietary maize return to Formative levels.

[4] Upcoming micro-botanical analysis of flotation samples from Piñami by Zulema Terceros Cespedes will give us more finely-grained evidence to see if there were fluctuations over time in the quantity of maize.

Figure List for Chapter 7

Chapter 8: Conclusion

This dissertation began by posing two central questions, asking (1) what Piñami's evidence revealed about Cochabamba, Tiwanaku and the relations between the two and (2) how the evidence could help refine the chronology of the Central Valley. I have demonstrated throughout this dissertation how invaluable the findings of the Piñami Project have been in answering these questions.

Contributions to Chronology

The Piñami Project has made important contributions to Central Valley chronology. It yielded four new radiocarbon dates to a chronology previously based on few such dates, a contribution that led me to propose in Chapter 3 a start date of at least AD 700 for the beginning of the Middle Horizon in the Central Valley flatlands, later than previously accepted. Further, the strong similarity of dates between Piñami (combined with the single date from Quillacollo) and the Tiwanaku periphery of Moquegua suggests that Tiwanaku expansion to Cochabamba was similar in timing to Tiwanaku expansion to

other peripheries and is therefore consistent with the idea of a larger southern Titicaca pattern of expansion.

The Piñami findings also confirm the distinctions of the Illataco Phase and the Piñami Phase and additionally support further subdivision of the Piñami Phase into Early Piñami and Late Piñami. The division into the Illataco and Piñami phases made by Cespedes Paz was an important step in refining the chronology of the Western Cochabamba Valleys, but the Piñami findings make the distinctions between the Illataco Phase and the Piñami Phase clearer. In addition, I have demonstrated why further subdivision is warranted. My proposal that the Piñami Phase be divided into Early and Late is supported by a large mass of ceramic data and burial data. For ceramics, fineware is approximately a third of the overall assemblage in the Early Piñami Phase but is reduced to a quarter of the assemblage in the Late Piñami Phase. In addition, by Late Piñami there is a marked decrease in imported Tiwanaku ceramics and a reduction in the frequency of Tiwanaku anthrozoomorphic motifs. For burials, an examination of over 60 funerary contexts also reveals differences between Early Piñami and Late Piñami. From Early to Late burials, there is a reduction in ceramic and sumptuary offering type, quantity and variety, a change in complex tomb construction material from stone to adobe, and increasing homogeneity in body position. Overall, by Late Piñami, we see the results of blending over time: Tiwanaku patterns are clearly evident, but a distinctly Cochabamba flare is visible within the more homogeneous traditions. Together, ceramic and mortuary evidence make a strong case for the subdivision of the Piñami Phase into Early Piñami and Late Piñami.

Impact of Tiwanaku on the Central Valley of Cochabamba

The findings of the Piñami Project demonstrate the great impact of Tiwanaku on the Central Valley in ceramics and drinking, mortuary ritual, and economic and household activities. In addition, they offer evidence concerning the movement of people from the highlands and concerning the varied ethnic make-up of the people of Piñami.

Contact between Tiwanaku and Cochabamba resulted in a striking new Tiwanaku redware style that I have designated as Central Valley Cochabamba Tiwanaku or CVCT. The strong similarity of CVCT to highland Tiwanaku in terms of forms, iconography, technology and practice shows that CVCT is not a distant copy or "derived" style but a Tiwanaku style on par with the Tiwanaku style from other peripheries such as Moquegua and Lukurmata.

CVCT forms, motifs and color are generally consistent with the highland Tiwanaku style, and, notably, some of the less obvious traits of the Tiwanaku style—the symmetry, banding and aspects of the technology of production—are very similar, resulting in vessels that both look and feel "Tiwanaku". I have demonstrated that not only was the ceramic style adopted at Piñami, but so was the behavior surrounding the use of Tiwanaku pottery, and I have argued that the use of CVCT style vessels over hundreds of years provided continual, highly visible and tactile reminders of ties to Tiwanaku.

The association between the Central Valley and Tiwanaku was very strong by the Piñami Phase, as evidenced especially by the rise in frequency of servingware and the transition from multiple decorated styles to complete dominance of the CVCT style, so that we see in ceramic fineware evidence of the effectiveness of the Tiwanaku mystique. CVCT fineware expressed both materially and symbolically the transformation of local social identities. Local identity changed rapidly to one that referenced Tiwanaku in definitive ways; at the household level, individuals sent messages to others in their community of their acceptance not only of Tiwanaku drinking practices but also of Tiwanaku ideology and political affiliation. Thus, Tiwanaku drinking customs promoted social cohesion at the household level, at home, and abroad, using paraphernalia heavily coded with state symbols.

Our Piñami mortuary sample is substantial and well-documented. In chapter 6, I made the case that Tiwanaku had a substantial impact on Piñami burial rituals. In the Early Group burials, Tiwanaku impact on mortuary traditions is seen clearly in the presence of the seated flexed position, the widespread use of Tiwanaku vessels as offerings, and changes in the design and size of stone tombs.

The richness of the mortuary findings allows a diachronic approach to Piñami burials. The evidence points to the influence of Tiwanaku on burial traditions over time. In the Early Piñami Phase, burial offerings included Tiwanaku or CVCT styles but also a variety of local styles, some of which were no longer being produced, while in their daily life the people of Piñami were drinking and eating from CVCT vessels almost exclusively. By Late Piñami, burial offering styles have caught up with the ceramic

styles used in daily life and the CVCT style is dominant in both the mortuary and domestic arenas.

I have argued that the two flexed burial positions reflect two sets of mortuary traditions, one more closely tied to Tiwanaku than the other. My argument that this patterned variation could represent a multi-ethnic population is supported by the evidence of variable cranial deformation and by the strontium isotope studies that demonstrated the presence of people from outside the Cochabamba Valleys, specifically from Tiwanaku and farther north. Amidst this variation, however, traditions were not segregated spatially within the Early Group cemetery and we did not find segregation of individuals with distinct cranial deformation styles or the separation of local and non-local individuals within the cemetery. So, while there does seem to have been some ethnic diversity in the population, the people of Piñami shared the same mortuary space.

Chapter 7 added to the picture of daily life in Middle Horizon Piñami in a variety of ways, including ones that point to the impact of Tiwanaku on Cochabamba. The first of these concerns the evidence of intensification of food production. Though the evidence for surplus maize production for export is suggestive rather than conclusive, the use of larger and more numerous storage pits, the presence of Piñami varieties of maize at Tiwanaku and the increasing importance of camelids support the argument that there was excess maize production for exportation to the highlands. Second, household evidence showed the impact of Tiwanaku through changes in utilitarian vessel forms, changes in cooking technology, and the presence of items considered diagnostic of Tiwanaku occupations – snuff paraphernalia, *trompos* and mandible scrapers. In addition, the presence of a consistent 8 to 15 degree east of north orientation in architectural layout and

burials at Piñami reflects a shared essential cosmology with Tiwanaku that was regularly renewed by the construction of new buildings and burials over hundreds of years.

The Tiwanaku State and the Nature of Its Expansion

Theoretical Models

As Bermann noted in his studies of households at the Tiwanaku site of Lukurmata, different categories of artifact types do not change at the same rate. Indeed, as he found at Lukurmata, there were different rates of change in categories such as fineware ceramics, burials, middens, etc. To avoid "distorted reconstructions of diachronic change at sites… different lines of evidence need to be integrated to arrive at a meaningful understanding of change in prehistoric societies" (Bermann 1994:255). We were very fortunate at Piñami to have a wide range of artifact types from a long stretch of time. We saw, as noted above and in keeping with Bermann's comments, that burial traditions changed more slowly than did vessel styles and drinking customs. The broad range of evidence from Piñami outlined above fits together to show the great impact of Tiwanaku on Cochabamba, contradicting the Higueras Hare "*status quo*" diffusion model of the Tiwanaku style that was based on very limited types of evidence (see discussion in Chapter 2).

In Chapter 2, I introduced theoretical models for understanding the nature of state expansion, drawing particular attention to a model put forward by Blanton and colleagues in which states range along a continuum from exclusionary to corporate states. The Piñami evidence shows that Tiwanaku had more corporate state than exclusionary state characteristics: locals actively incorporated a Tiwanaku identity, and markers of Tiwanaku culture were widespread rather than restricted to elites. In particular, the corporate nature of Tiwanaku is reflected in the large increase in drinking vessels at Piñami that began in the Illataco Phase and in the widespread adoption of drinking rituals involving symbolically charged ceramic cups. By the Late Piñami Phase, Tiwanaku corporate ideology remained in force, as ritual paraphernalia and fineware ceramics remained widely distributed.

As for the question of direct control over Cochabamba, the absence of evidence of direct control at Piñami is not enough to prove indirect control. However, the strong evidence of local response unearthed at Piñami, showing in a variety of ways the adoption of styles, technology, customs, symbols and everyday household items, supports the view of indirect control and the exercise of soft power in Tiwanaku expansion. The two apparently higher status burials found at Piñami, reflecting a blending of local and Tiwanaku mortuary traditions, also suggest indirect control and soft power in that these elite persons may well have had ties to and responsibilities toward both the local population and Tiwanaku.

The findings from Piñami also speak to another aspect of the Tiwanaku state—its strength. The evidence supports a view of Tiwanaku as a strong, durable state rather than a weak confederation. The overall Tiwanaku-ization of the Central Valley during the

Middle Horizon is suggestive of a directed and long-standing connection between the regions that lasted for hundreds of years. Of particular importance is evidence indicating a transformation in the Central Valley political economy to one focused intensively on maize, valued at Tiwanaku. If Middle Horizon local elites or Tiwanaku administrative centers are confirmed for Cochabamba, it will further bolster the view of Tiwanaku as a strong and expansive state, but I consider that even the current evidence fits with a model of a strong, long-lasting and effective corporate state.

The Nature of Tiwanaku Expansion into Cochabamba

The Central Valley sees waves of change during the Middle Horizon. During the Illataco Phase, there is greatly increased interregional contact and access to goods from a variety of areas outside the Central Valley. While there is evidence that some interregional trade occurred during the Formative, the abrupt change from the Late Formative to the Illataco Phase from few ceramic styles to many, including Tiwanaku redware and blackware and other styles from outside the Central Valley, points to a great increase in interregional trade that occurred with Tiwanaku contact. The Tiwanaku contact likely came from various areas, possibly at the hands of independent traders or lineage groups looking to establish lower-elevation footholds.

In the Early Piñami Phase, we see through ceramics a dramatic shift away from variable interregional ties to a singular discrete symbolic identity that is foremost Tiwanaku. This sudden change in domestic ceramics is not a natural outgrowth of the earlier variety slowly shifting into a more and more Tiwanaku frame. I believe that the

dramatic increase of CVCT indicates a political change likely based on Central Valley maize production.

Mortuary results from Early Piñami present a view of Tiwanaku expansion and local response that differs from what is found in other peripheries. Early Group burials do not indicate that Piñami was a diaspora of purely transplanted Tiwanakans (as found in Moquegua) or a segregated enclave of Tiwanaku immigrants within a larger local population (as found in Azapa), nor does the evidence suggest solely long-distance trade of Tiwanaku goods (as found in San Pedro de Atacama). Instead the burials indicate the movement and incorporation of people from Tiwanaku and beyond to Piñami—people who intermixed with the local population and likely intermarried. The Early Group burials evidence great variety and suggest that even from the early Middle Horizon, Tiwanaku vessels and mortuary customs were accepted and emulated.

By Late Piñami, both Tiwanaku ceramic and mortuary patterns continued and were strongly expressed, though with a distinctly Cochabamba flare. The widespread access to and acceptance of Tiwanaku traditions alongside the preservation of local traditions reflect the nature of the Tiwanaku state, which allows variability in an outlying region (Janusek 2003a, b).

I have found the results of the Piñami excavation to be strongly suggestive concerning relations between Tiwanaku and Cochabamba. To begin, I propose that open access to Tiwanaku fineware ceramics and other ritual items characteristic of a corporate state during the Illataco Phase was alluring in the Central Valley and helped establish new alliances and trade partners. The Piñami Phase's explosion in production of the CVCT style may indicate that incorporation increased the Central Valley's status, leading to a

new overarching social identity in the Central Valley—that of a key periphery linked to the capital—that was expressed by widespread production and use of the Central Valley version of the Tiwanaku state style. The dominance of Tiwanaku styles in the Early Piñami Phase may well represent intervention by the Tiwanaku ruling elite to gain greater control over the Central Valley.

The Piñami findings are also revealing and suggestive as to immigration and population issues. As detailed in Chapter 4, the conformity of the early CVCT to Tiwanaku norms suggests that early producers of CVCT had intimate knowledge of Tiwanaku ceramic canons and production techniques. Similarity in use practices indicates conscious imitation of highland traditions. Thus, ceramic fineware evidence supports the model that during the Middle Horizon a significant number of Tiwanakans, including traders and colonists, immigrated to the Western Valleys, bringing new material culture and an ideology and worldview that quickly gained acceptance. As also noted in Chapter 4, the use of ethnoarchaeological models to assess the transition to CVCT dominance can provide clues as to social change in the Central Valley. A dramatic shift in ceramic vessel style and context of use can indicate a wholesale replacement of local peoples by immigrants, but this does not appear to have been the case in the Central Valley of Cochabamba. At both Piñami and Quillacollo, the variety of local ceramic styles that continue during the transitional Illataco Phase suggests that at least part of the pre-existing population continued at those sites.

Finally, I argued in Chapter 5 that the increased importance of drinking and the inclusiveness of Tiwanaku drinking customs at Piñami greatly facilitated the integration process of the local population. Instead of a practice restricted to the elite or to feasting

contexts, the new custom of *chicha* drinking at the household level effectively integrated the Piñami population into the Tiwanaku sphere. The radical transformation of vessels and drinking practices in the Central Valley resulted in drinking vessels with Tiwanaku symbols becoming part of a pattern of ritual commensalism at the domestic level that lasted hundreds of years.

Conclusion

Our Piñami excavation yielded invaluable evidence from the intimate level of the household, where the decisions of individuals to adopt or resist foreign social identities may best be seen. The evidence clarified the chronology of the Central Valley and it manifested the great impact of Tiwanaku on Cochabamba, including the local adoption of styles, practices and ideology, and showed the shared cosmology between the two. It supports the view of the Central Valley as an agricultural periphery similar to, and possibly as important to Tiwanaku as, Lukurmata and Moquegua.

Much work remains to be done in Cochabamba. We certainly need more radiocarbon dates to better tie Cochabamba history into the larger chronology of the Titicaca Basin. More settlement survey needs to be done throughout the larger Cochabamba region to determine local settlement patterns and political relationships. We need more information on the Late Formative—its burial styles, architecture and food use—to see the extent of the local transformation during the Middle Horizon. Studies of

food use and micro-botanical analyses, especially in Late Formative contexts, would allow more detailed examination of changes in production strategies over time. Further analysis of Piñami human remains can give us more data on possible colonists from Tiwanaku. Finally, the impact on the Central Valley of the end of the Tiwanaku state (in other words, the transition from the Middle Horizon to the Late Intermediate Period) is a subject certainly worthy of more in-depth research.

What is clear is that the Central Valley and the larger region of the Cochabamba Western Valleys was of great importance to Tiwanaku for hundreds of years, such that studies in Cochabamba are critical to making a more robust and dynamic model of the Tiwanaku state. In sum, this work fills a vital gap in Tiwanaku studies that have underestimated Cochabamba in models of Tiwanaku expansion and peripheries.

Figures for Chapter 1

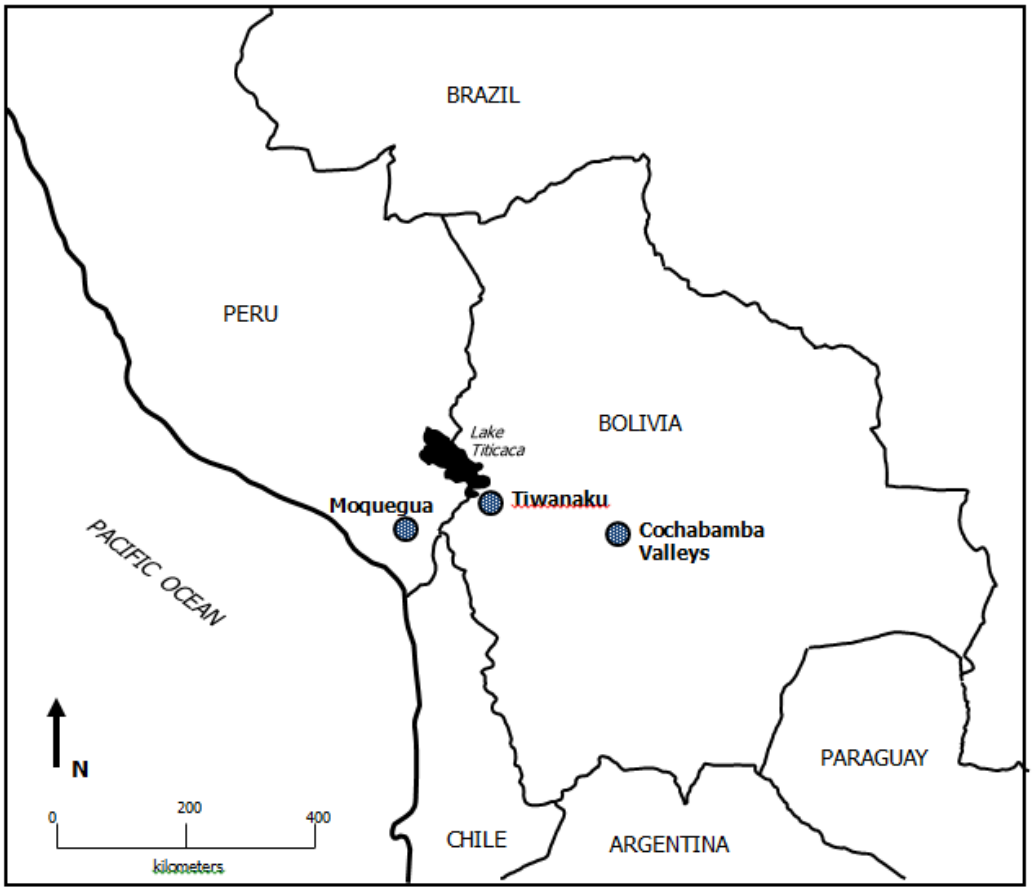


Figure 1.1. Map and satellite view of the South Central Andes. The satellite view shows circles around the key valleys. The Tiwanaku core (yellow), Moquegua (red) and the Western Valleys of Cochabamba (blue). The blue line shows the linear extent of the Cochabamba Valley system.

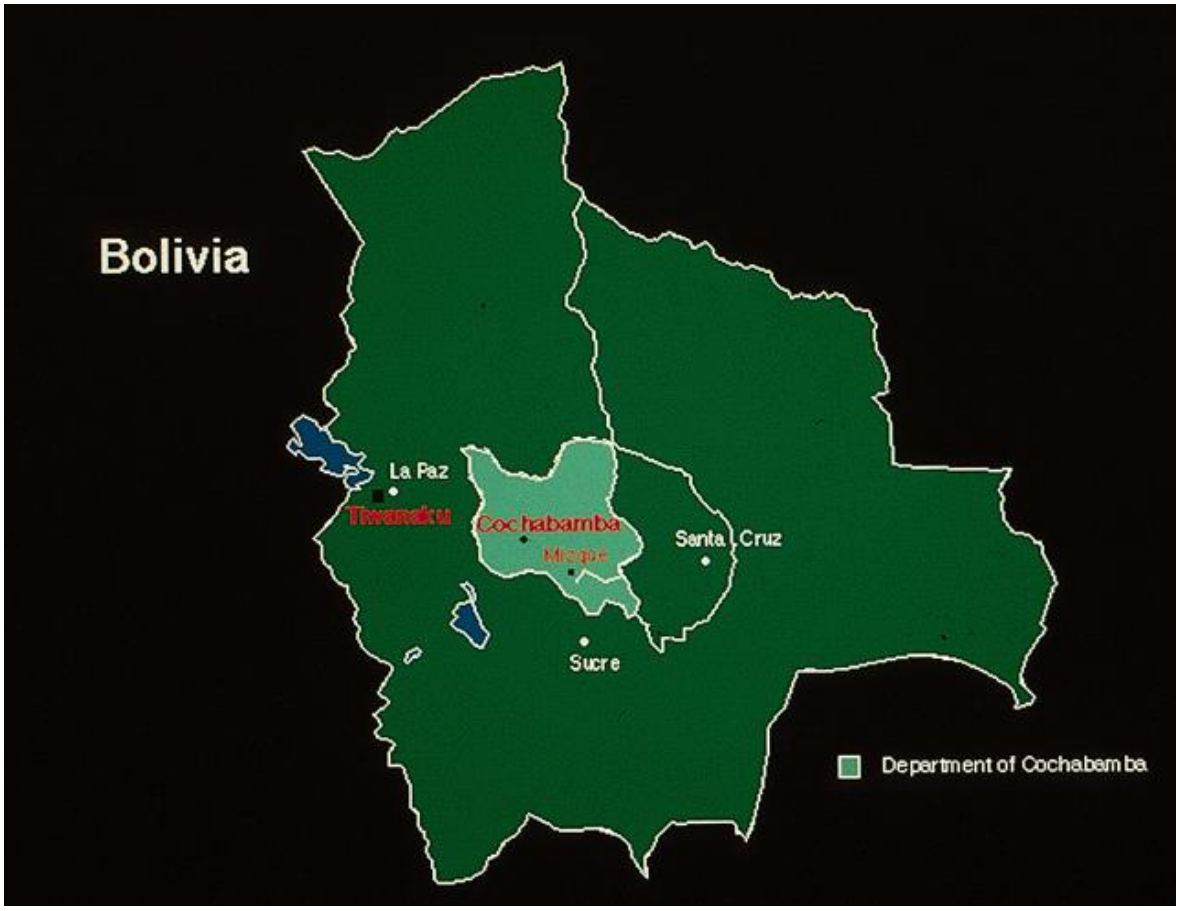
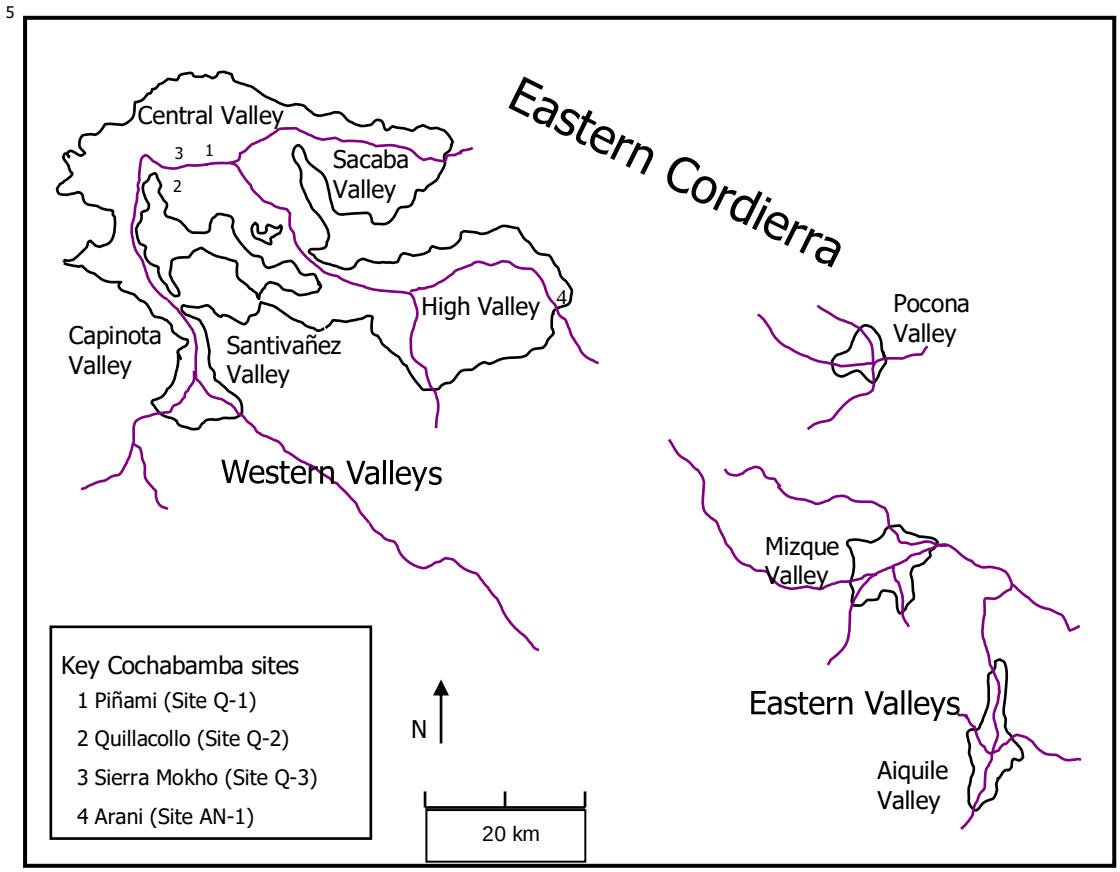


Figure 1.2. Map of Bolivia showing Department of Cochabamba.



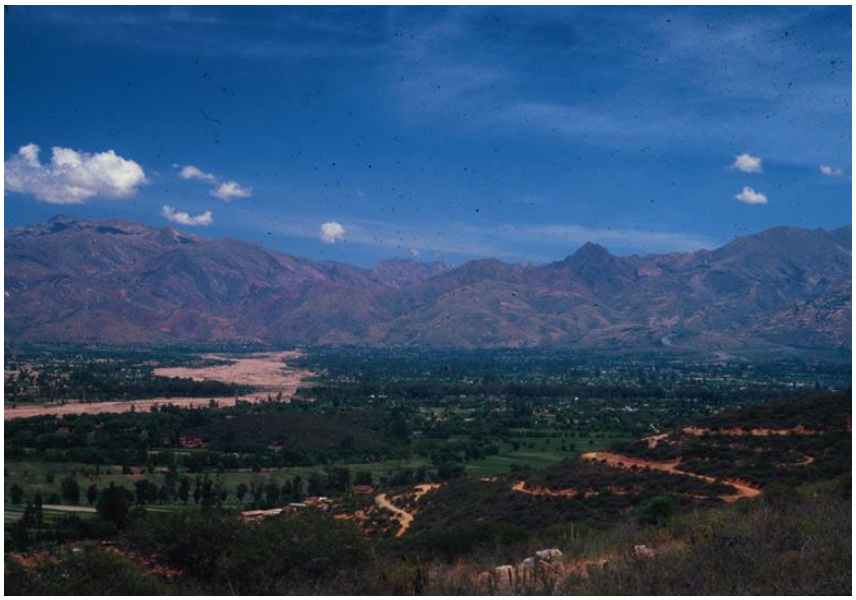


Figure 1.3. Map of Western and Eastern Valleys of Cochabamba. Photo facing north across the Central Valley with high mountains of the Eastern Cordierra in the background.

Figure 1.4. Photo of current mound showing .2 ha size.

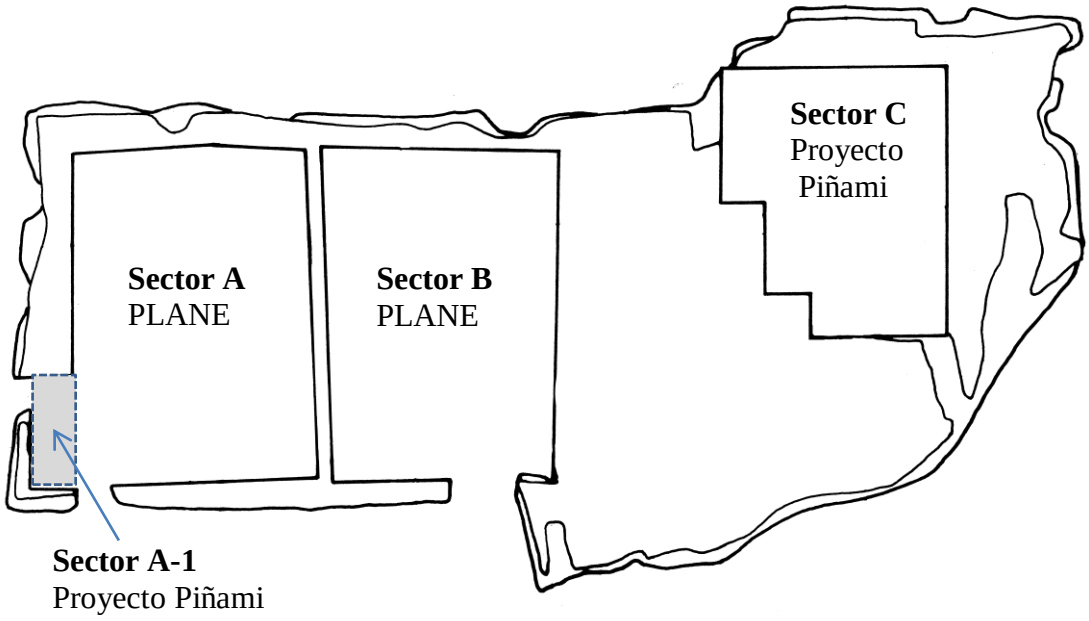


Figure 1.5. Piñami Mound showing excavation Sectors A, A-1, B and C.

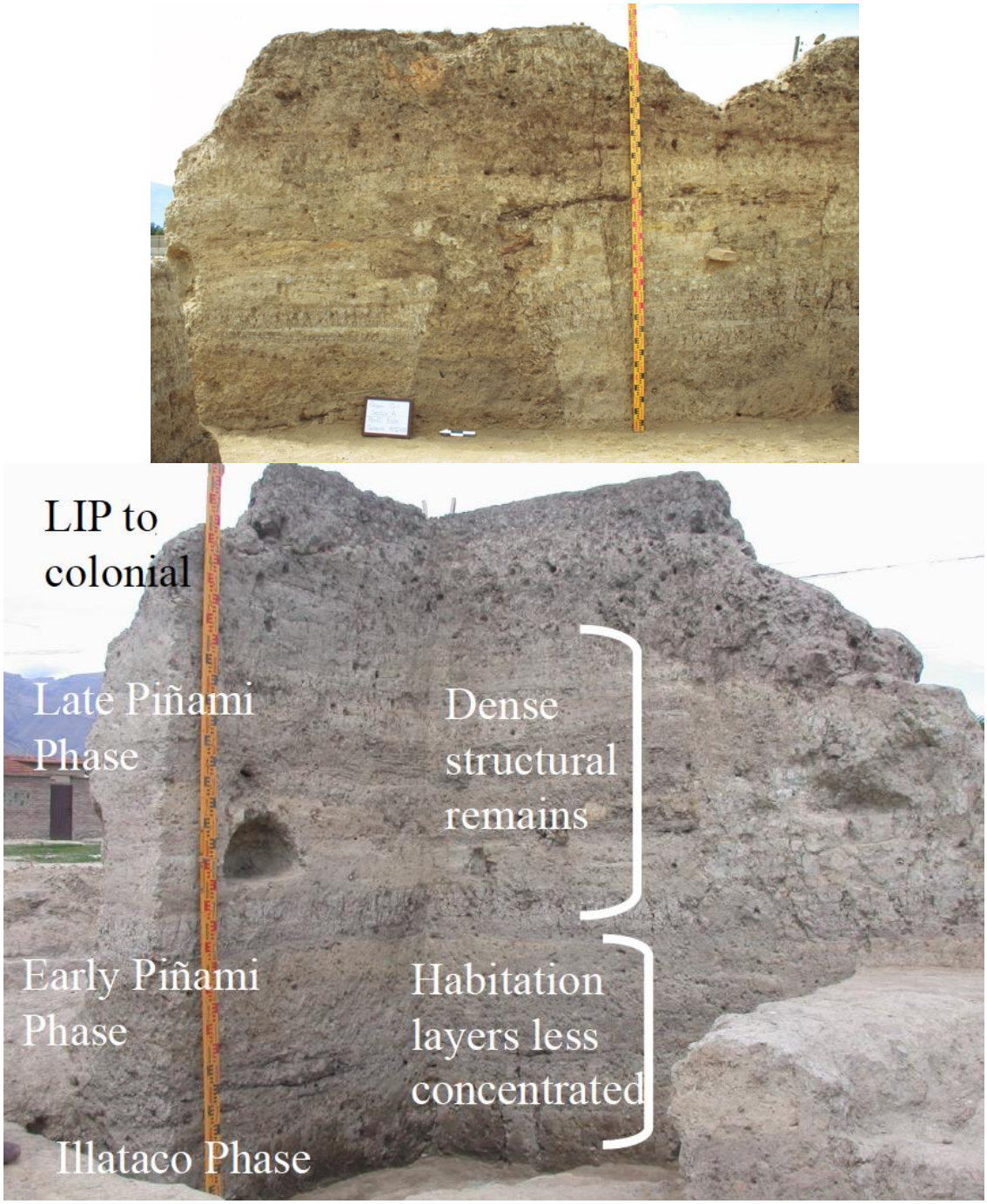


Figure 1.6. Photos of Sector A-1 before and after excavation.

Figures for Chapter 3

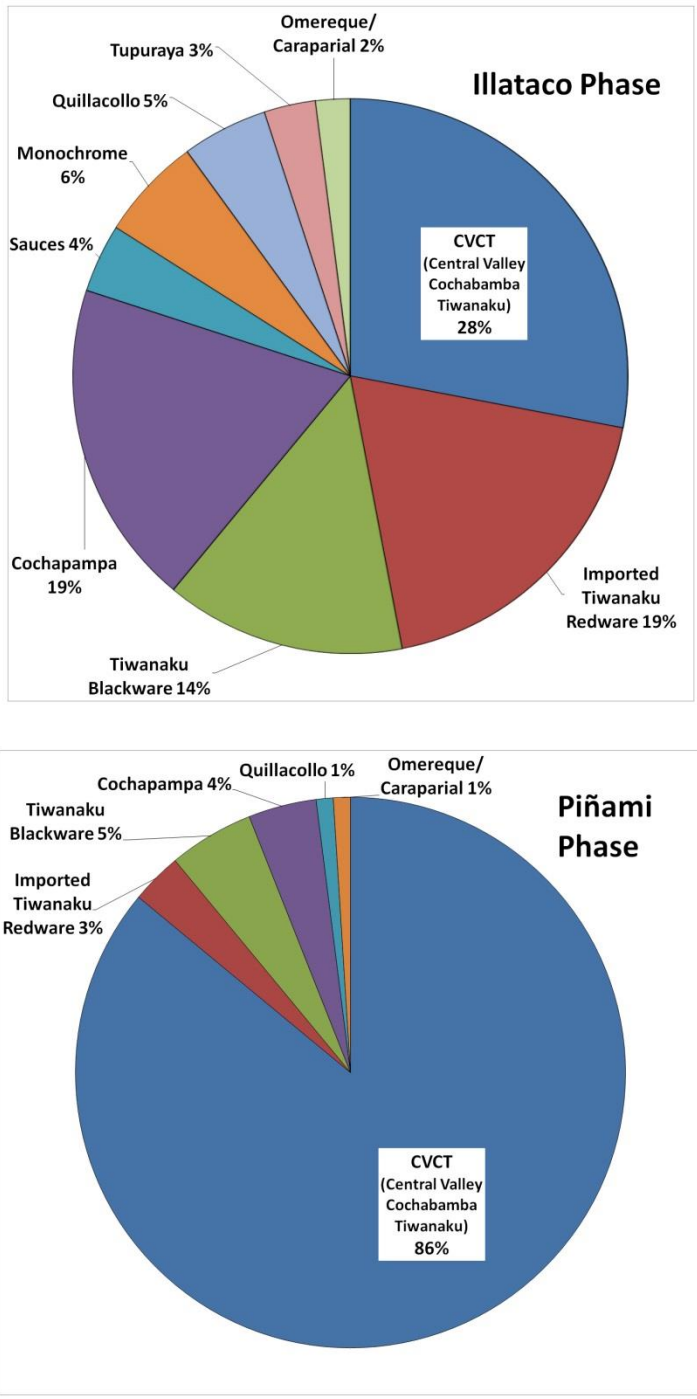


Figure 3.1. Comparison of styles present during the Illataco and Piñami phases.

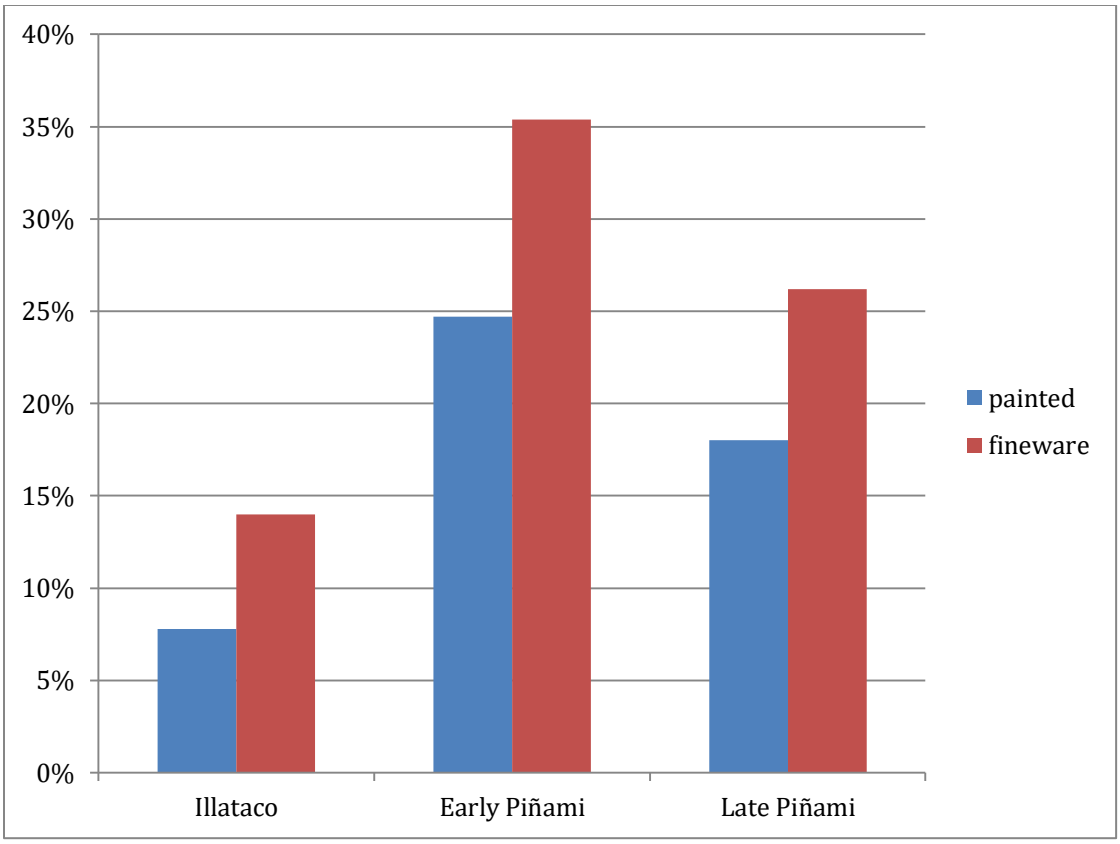


Figure 3.2. Comparison of frequency of decorated sherds and fineware sherds for the Illataco, Early Piñami and Late Piñami phases.

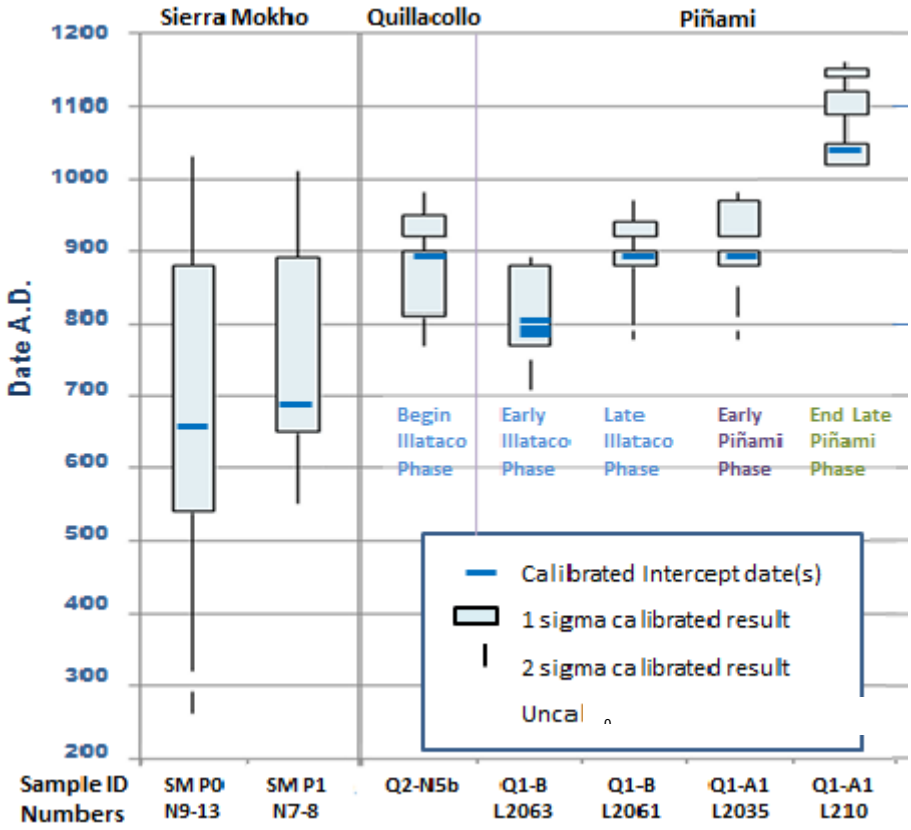
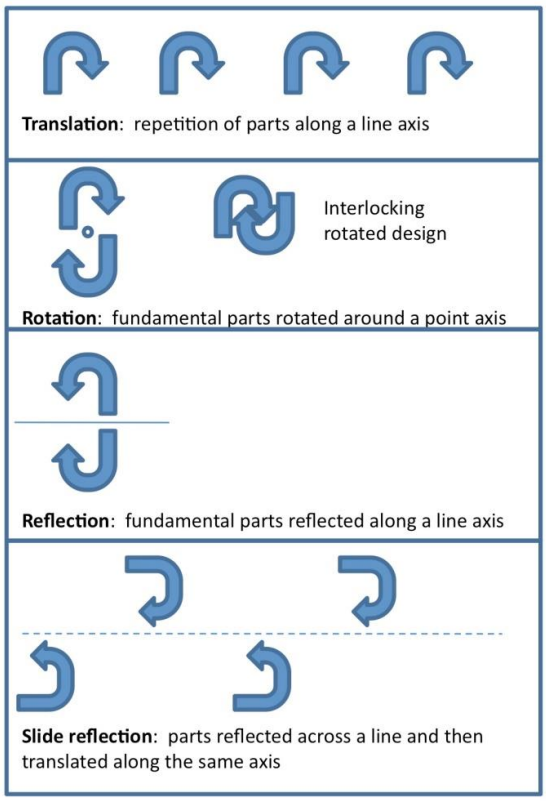
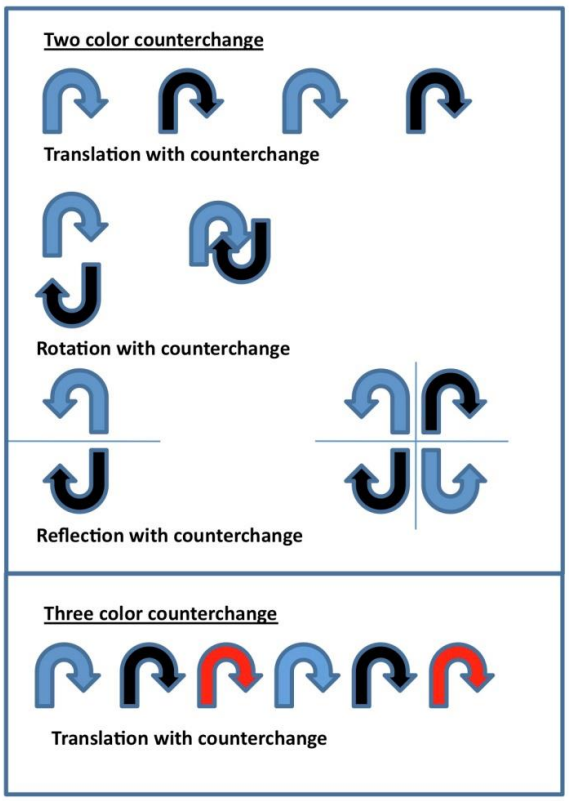


Figure 3.3. Diagram of radiocarbon dates from the Central Valley.

Figures for Chapter 4



(a)



(b)

Figure 4.1. Definitions of symmetry terms used in text. (a) Basic symmetry motions between design repetitions. (b) Key types of counterchange, color alternation between design repetitions.

Figure 4.2. Quillacollo style bowls excavated at Quillacollo (Q-2). Right, fragments in the Quillacollo style. Photo by author. Left, illustration of Quillacollo bowl forms, adapted from Céspedes Paz et al. 1994, original drawings by Javier Gonzales.

Figure 4.3. Tupuraya style sherds from Piñami (left) and Quillacollo (right).

Figure 4.4. Sauces style vessels from Piñami.

Figure 4.5. Caraparial style vessels. Diagnostic of the style are geometric motifs that use black in similar proportion to the colored design, separated by a thin white outline. Left, example from Quillacollo of interlocking volute motif of black and purple. Right, example from private collection with black used as a background and color counterchange occurring between design repetitions. Both examples show the black-white-black rim bands characteristic of the Caraparial and Omereque styles. Photographs by the author.

(a)

(b)

Figure 4.6. Omereque style vessels. The Omereque style is polychromatic and uses distinctive stylized anthrozoomorphic motifs. Both examples show the black-white-black rim bands characteristic of the Caraparial and Omereque styles. Example (b) shows the three color counterchange characteristic of the Omereque style. *Vaso embudo* (a) is from a private collection, large platter (b) is from the museum collection of the Instituto de Investigaciónes Antropológicas y Museo Arqueológico, Universidad Mayor de San Simón, Cochabamba (INIAM-UMSS). Photos are by the author.

Figure 4.7. Omereque style three-color counterchange. The central motif is repeated twice via translation along the horizontal axis but uses three-color counterchange to differentiate key elements of the main design. The vessel is from the museum collection of the Instituto de Investigaciónes Antropológicas y Museo Arqueológico, Universidad Mayor de San Simón, Cochabamba (INIAM-UMSS). Photos by the author.

Figure 4.8. Cochapampa style vessels from Piñami.

Figure 4.9. Examples of imported Tiwanaku vessels from Piñami. All have clear highland temper and paste.

Figure 4.10. Tiwanaku blackware *kero* from Piñami. Vessel shows clear highland mica temper.

(a) (b)

(c)

Figure 4.11. Imported Tiwanaku style *tazones* with characteristics more common in the Katari Valley than the Tiwanaku Valley (Janusek 203:80): (a) tanware, (b) *tazón* with an exterior red band, (c) continuous volute ending in a face. Examples (a) and (b) are from Piñami, (c) is from Quillacollo.

Figure 4.12. Examples of imported Tiwanaku *incensarios* from Piñami. The vessels have non-local pastes and temper.

Figure 4.13. CVCT style *keros* from Piñami showing standard (lower left) and tall variations.

Figure 4.14. CVCT *Vasos embudos* (funnel cups) from Piñami. The *vaso embudo* is a drinking vessel common in the Omereque and Caraparial styles which was incorporated in the CVCT style.

Figure 4.15. Example of rare CVCT *kero* variant from an Early Middle Horizon context at Piñami. This form appears to be a synthesis of the *kero* and the *vaso embudo*.

Figure 4.16. CVCT *tazones* from Piñami. CVCT decorative motifs on *tazones* are primarily geometric as is the case for Tiwanaku *tazones*. However, CVCT *tazones* are smaller on average than their highland counterparts.

Figure 4.17. CVCT *vasija* and *jarra* forms from Piñami.

Figure 4.18. Common CVCT geometric motifs. All vessels are from Piñami.

Figure 4.19. CVCT anthropomorphic head motifs. All vessels are from Piñami.

Figure 4.20. CVCT variations of zoomorphic motifs including abbreviated or mixed animal motifs. All vessels are from Piñami.

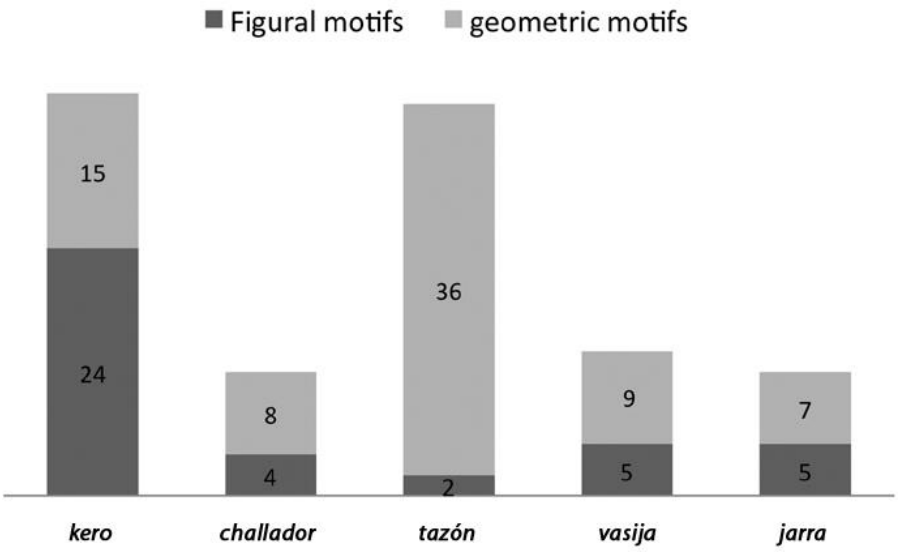


Figure 4.21. Comparison of figural central motifs vs. geometric central motifs by vessel form. All examples are from whole vessels (n =115) from Piñami. *Keros* are the only vessel type with a majority of figural motifs.

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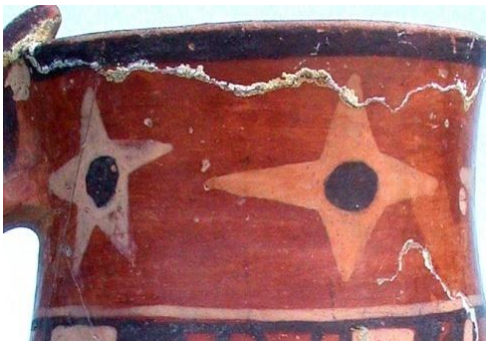
(a)



(b)

(c)

(d)

(e)

Figure 4.22. CVCT motifs from Piñami that have been considered to be diagnostic of "Cochabamba-Tiwanaku" (Janusek 2003:75; Fig 3.69)—(a) inverted scroll; (b) star/eclipse; (c) dotted cross; (d) half cross (e), diamond (snake) band motifs.

Figure 4.23. CVCT symmetry patterns. Top, two photos of same vessel showing the most common CVCT symmetry pattern for major motif repetition: translation along a horizontal axis with no color counterchange between repetitions. Bottom, CVCT vessels with more complex symmetry patterns, including color counterchange, rotation and reflection. All vessels are from Piñami.

Figure 4.24. Comparison of CVCT and Tiwanaku banding showing close similarity in placement, colors and band width. Imported Tiwanaku vessels on the left; CVCT vessels on the right. All vessels are from Piñami.

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Figure 4.25. Comparison of vessel form and painting technique between Sauces and Cochapampa vessels (left) and CVCT vessels (right). In keeping with the Tiwanaku style, CVCT vessels are generally more even and symmetrical in vessel form and paint application than the local Central Valley styles. All vessels are from Piñami.

(a)

(b)

Figure 4.26. Comparison of surface treatment between utilitarian and serving ware in local styles and CVCT. (a) Interior and exterior of Quillacollo bowls (left) and corresponding storage or cooking vessels (right). In these vessels the paste and temper used are the same and the surface treatment is almost identical. (b) Exterior of CVCT serving ware (left) and associated storage and cooking vessels (right). The CVCT serving ware is distinct from the utilitarian ware in terms of temper, slip application, smoothing and burnishing. All examples are from Quillacollo.

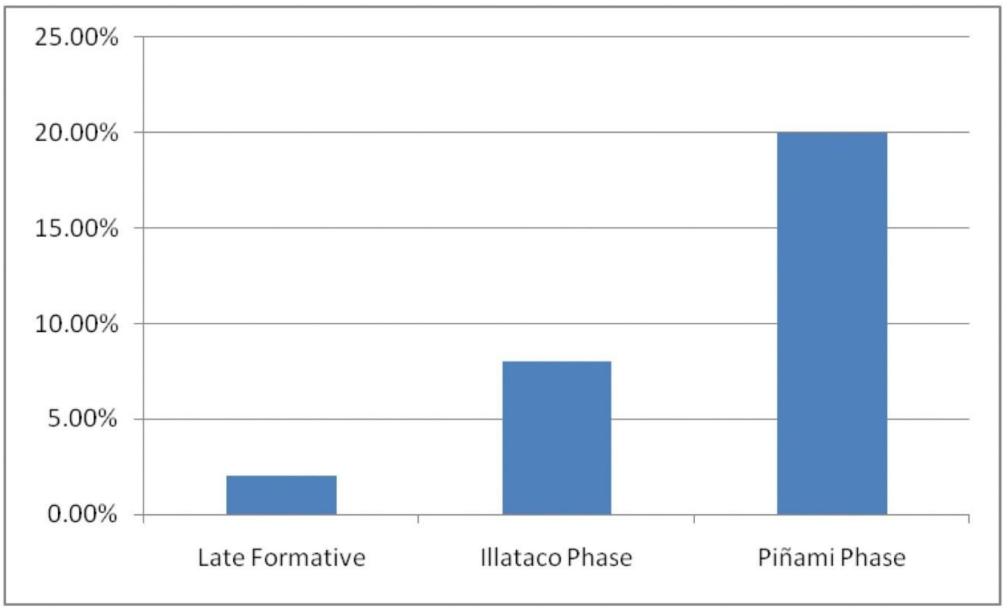

Figure 4.27. Graph showing noteworthy increase in the frequency of ceramic fineware at Piñami from the Late Formative to the Illataco Phase and then to the Piñami Phase.

Figures for Chapter 5

Figure 5.1. Drinking vessels in the Monochrome style of the Formative in Cochabamba. Vessels shown are unprovenienced vessels in the museum collection of *the Instituto de Investigaciónes Antropológicas y Museo Arqueológico, Universidad Mayor de San Simón*, Cochabamba (INIAM-UMSS). Drawings by author.

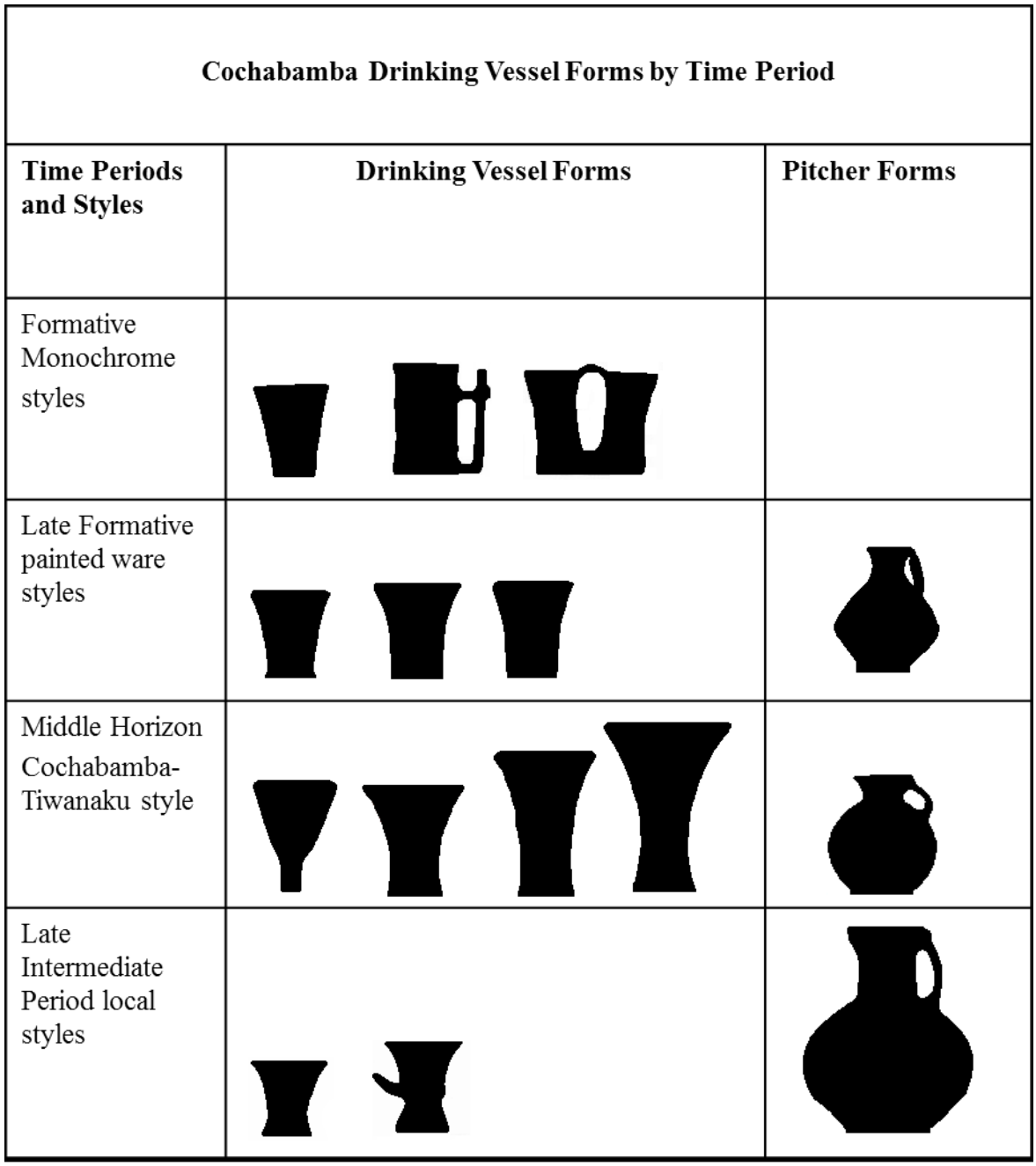

Figure 5.2. Drinking vessel forms by time period. All Middle Horizon and Late Intermediate forms come from Piñami. The left and center Late Formative drinking vessels come from the Cochabamba Museum collection (Döllerer 2004) and the Formative Monochrome examples come from, left to right: Cliza (Walter 1958), Conchupata (Pereira Herrera et al. 1992) and Mayra Pampa (Pereira Herrera et al. 2001).

Figure 5.3. *Kero* varieties from Piñami. Right and left *keros* are standard size. The center *kero* is the tall thinner Cochabamba Tiwanaku version of the *kero*. Note that the rim diameters on all three are the same.

Figure 5.4. Extra-large and standard *keros*. The *kero* on the right is a medium size from Piñami (16.2 cm tall, rim 15.0 cm), while the one on the left is extra large (25 cm tall, rim dia 18 cm). The extra-large vessel is from the excavation by Walter (1966) in the Mizque Valley (collection UMSS Archaeological Museum in Cochabamba) but is typical of rims of large *keros* found in excavations at Piñami. The design space on the larger *kero* is ~ 9 cm high and the vessel holds 1.5 liters.

Figure 5.5. Three *vasos embudos* (funnel cups) from Piñami burials. This vessel type is also referred to as a *challador* (offering cup), when it had a small hole in the base so the liquid would spill out (as an offering) while drinking. All show Tiwanaku iconography and banding.

Figure 5.6. Early Piñami Phase higher status gravelot (CF-27). Gravelot included seven drinking vessels of mixed local and Tiwanaku styles. The four small *vasos embudos* in the center front were found in pairs.

Figure 5.7. Paired *vasos embudos* drinking cups from higher status burials, CF-27 (left) and CF-36 (right).

Figure 5.8. Gravelot for adult female (CF-16) that includes two drinking vessels--one *kero* and one *vaso embudo*.

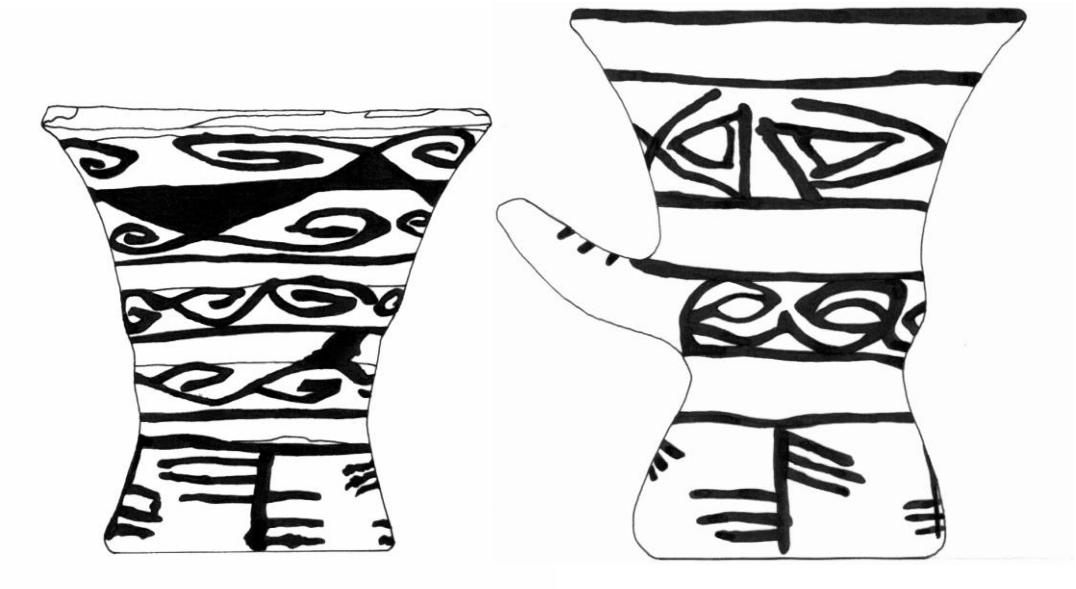

Figure 5.9. Late Intermediate Period Ciaco style drinking cups from Piñami. The one on the left is 10.3 cm tall and the one on the right is 12.8 cm tall.

Figure 5.10. Late Intermediate Period Ciaco style serving pitcher and drinking cup. The pitcher holds 4.5 liters, enough to fill 15 average size cups.

Figures for Chapter 6

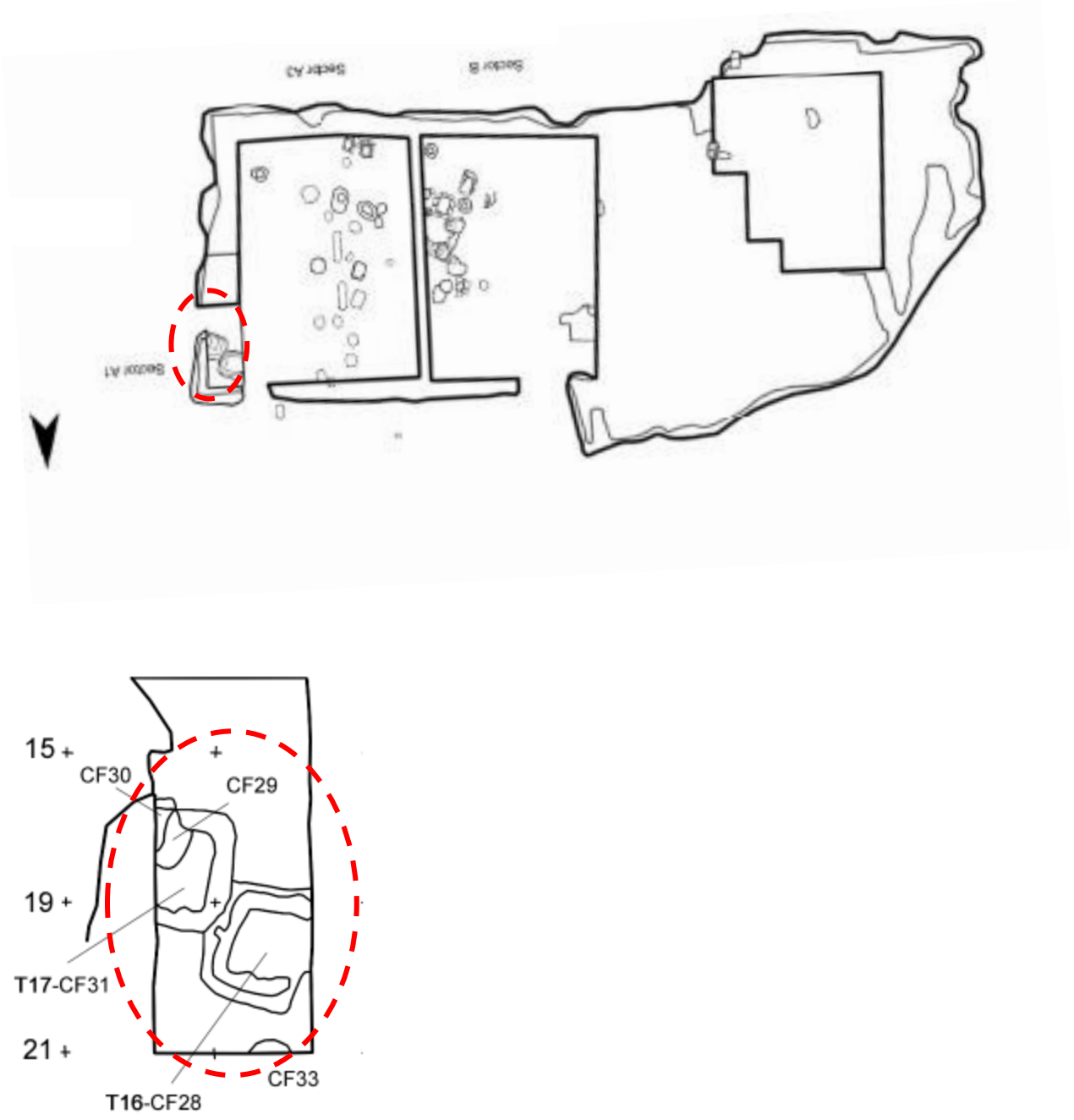

Figure 6.1. Map of Late Piñami Phase cemetery cluster. Above shows entire mound and location of burial cluster. Below shows detail with CF numbers.

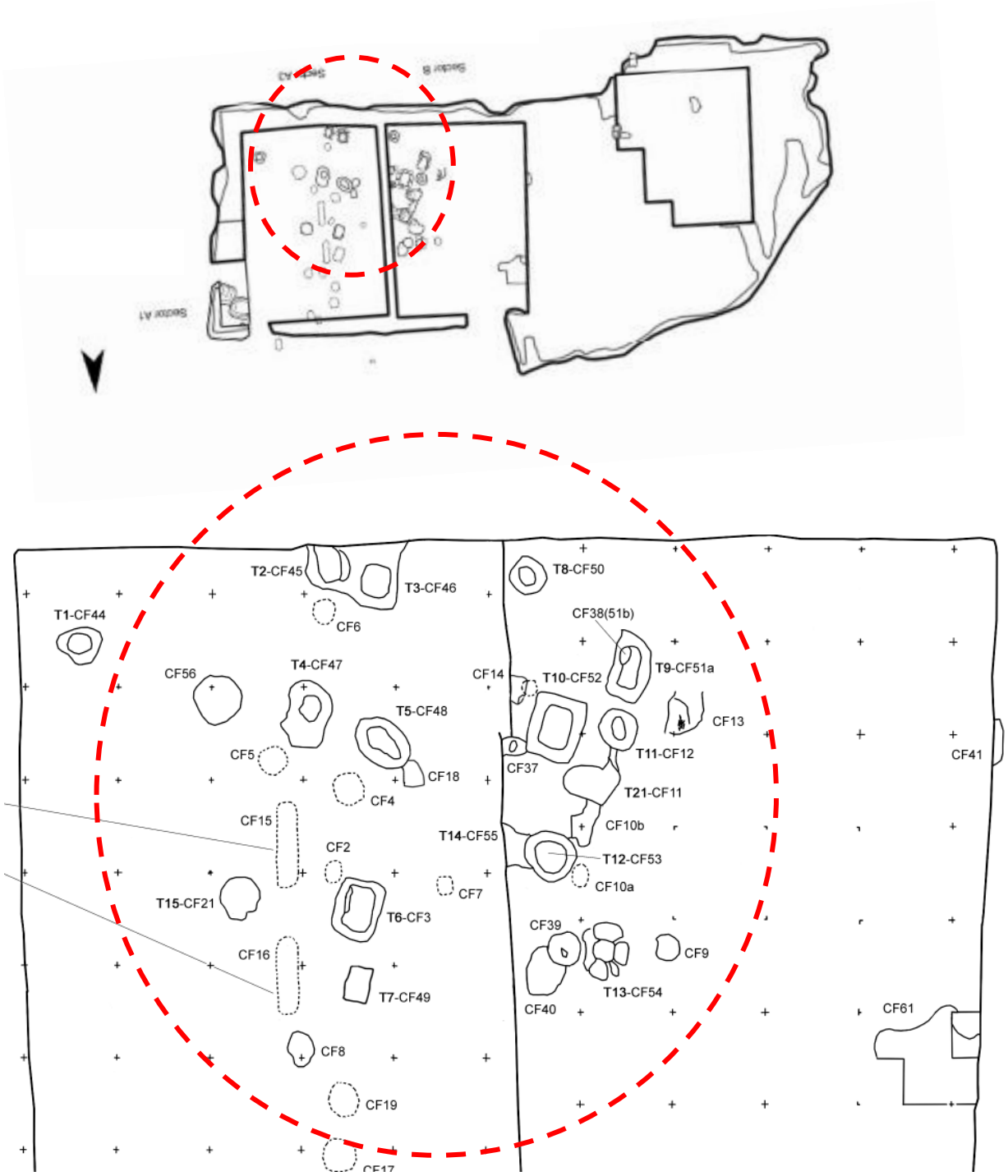

Figure 6.2. Map of Illataco/Early Piñami Phase cemetery cluster. Above shows entire mound and location of burial cluster. Below shows detail with CF numbers.

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Figure 6.3. Possible burial marker stone from CF-39a. The rectangular stone in 39a was on top of the body and offerings, placed on end to extend vertically above the pit, so it is likely that part of the stone was visible at the surface after burial. See CF-18 and CF-65 in Appendix 2 for other possible examples.

Figure 6.4. Examples of Early Group urn burials from Piñami. CF-2 (top) was a single urn burial. CF-5 (bottom) was a double urn burial. The *olla* (bottom left) was placed upside-down on top of a right-side-up *olla* (bottom right). For other urn burials, see CF-43 and CF-65, Appendix 2.

Figure 6.5. Secondary burial CF-9 showing bone arrangement. Skull (in lower left of photo, marked by arrow) was placed on its left side facing north. Long bones were arranged parallel to the north of the skull.

Figure 6.6. Structure Type 1: Irregular pit tombs. Irregular tombs are generally oval for on-the-side flexed burials or round for seated flexed burials, but the pit outline and shape are irregular, as seen in the photo (CF-15).

Figure 6.7. Structure Type 2: Cut walled tomb chambers without cover stones or surface markers. These burial chambers have straight walled sides and regular oval or round shapes. Above, CF-21; below, CF-25.

Figure 6.8. Structure Type 3: Cover stones over irregular or cut walled chambers. Upper photo is CF-19, a shallow depression with parallel cover stones placed immediately over the body. Lower photo is CF-12, a round cut pit that also had parallel slabs as a cover (similar to CF-19).

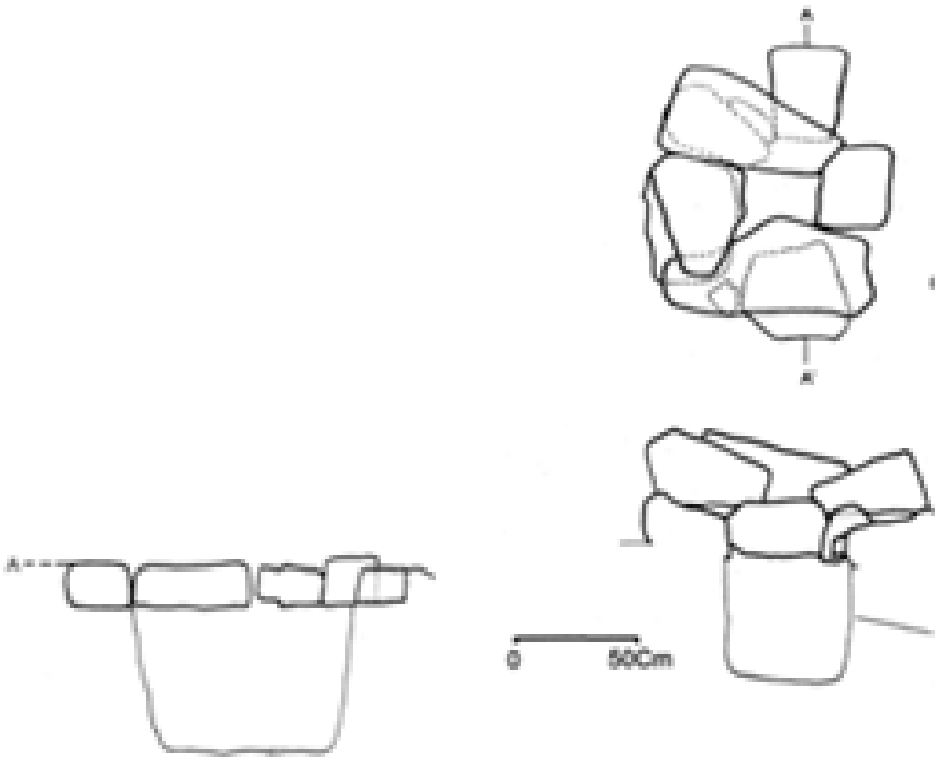


Figure 6.9. Structure Type 4: Chambers with stone collars and cover stones. On left, rectangular tomb, CF-46. On right, two views of round tomb, CF-54. Drawings by Gori Tumi Echevarria Lopez.

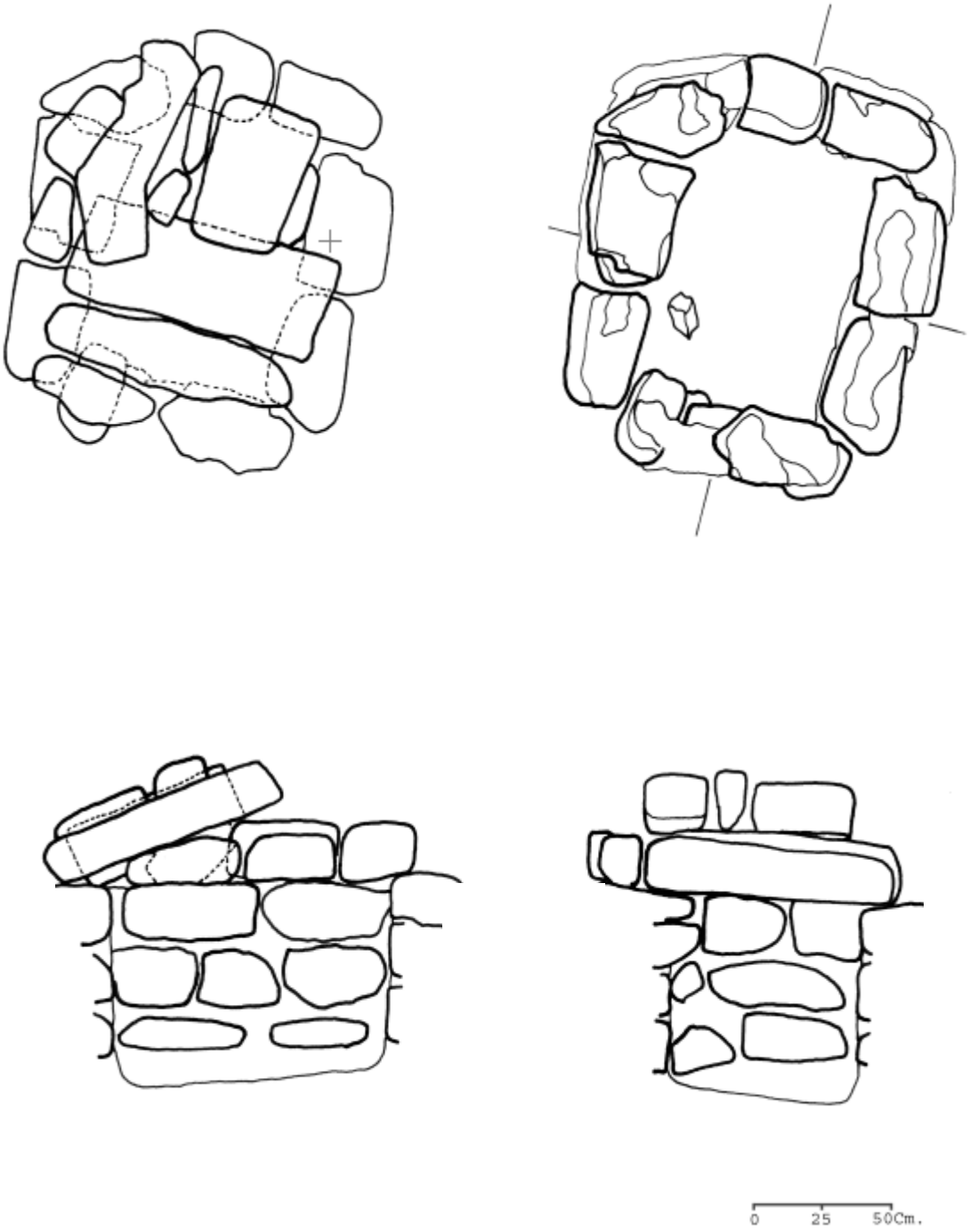


Figure 6.10. Structure Type 5: Stone-lined and roofed chambers (CF-52). Drawings by Gori Tumi Echevarria Lopez.

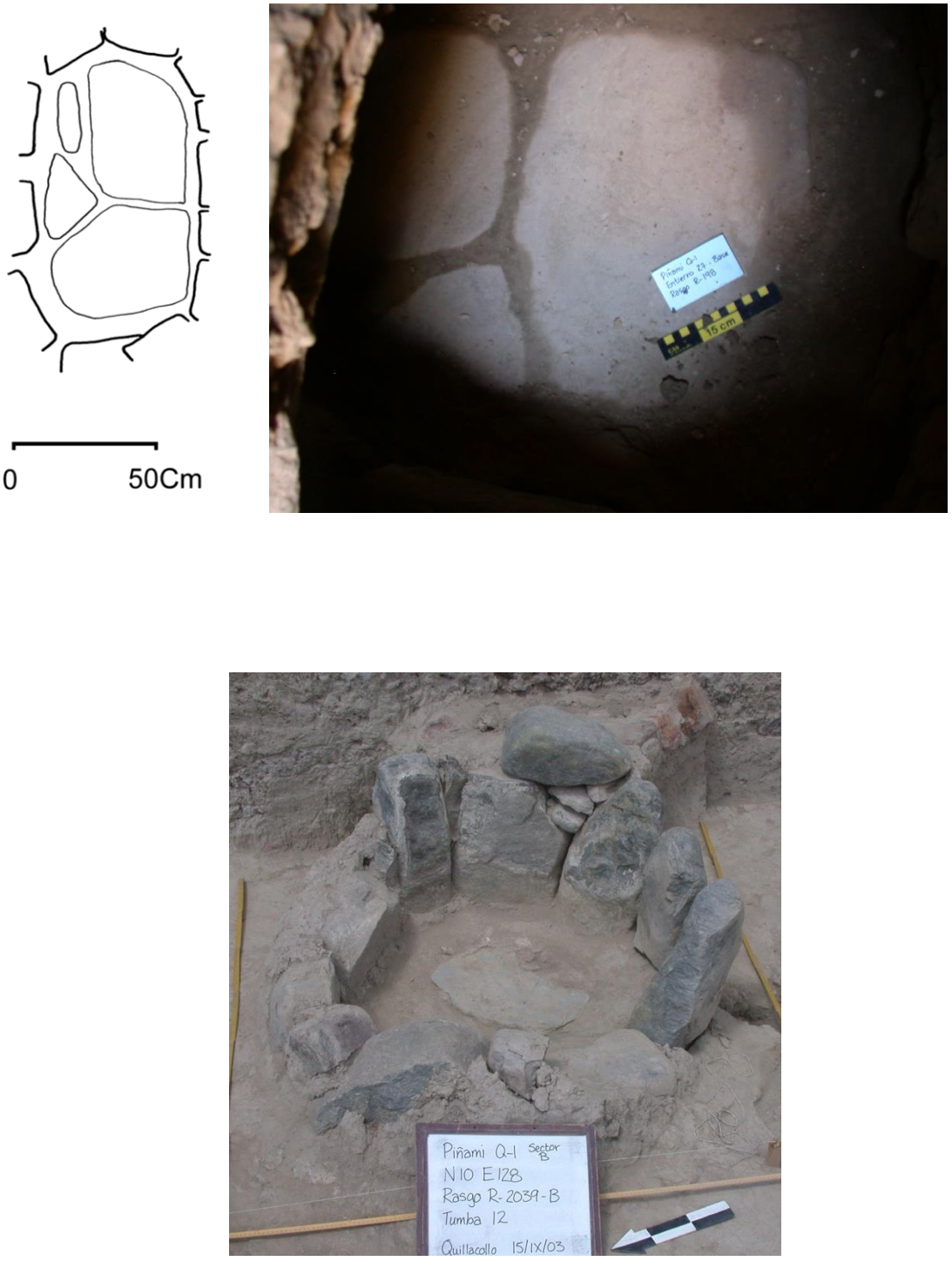


Figure 6.11. Variation in bases of stone-lined or collared tombs. Flat flagstones were used for tomb basses. CF-27 (above) had the most intricate stone floor of any found at Piñami. The more typical pattern was a single flat flagstone placed in the center of the base (below, CF-53).

Drawing by Gori Tumi Echevarria Lopez.

Figure 6.12. Interior walls of rectangular stone-lined tombs. Upper photo, CF-52; lower photo, CF-27.

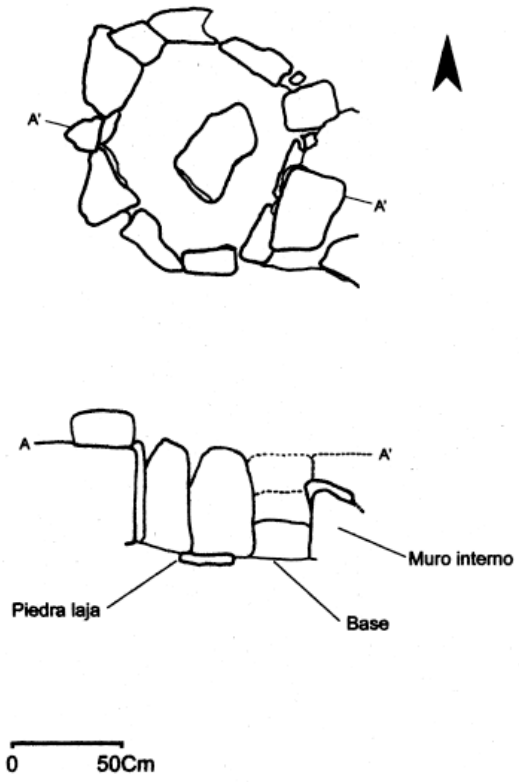


Figure 6.13. Round stone-lined tomb (CF-53) in photo. Upper drawing is top down view of walls and base. Lower drawing is side view of walls showing variable construction technique. Drawings by Gori Tumi Echevarria Lopez.

Figure 6.14. Structure Type 6: Adobe-lined tomb (CF-31). In this example, additional blocks of clay filled the space between the wall and the skull.

Figure 6.15. Structure Type 7: Free-standing adobe walled chamber in larger pit (CF-28). Top photo shows outline of larger pit. Middle photo shows free-standing walls built within the larger pit. Bottom photo shows the eroded blocks of clay/adobe that formed the cover to the burial.

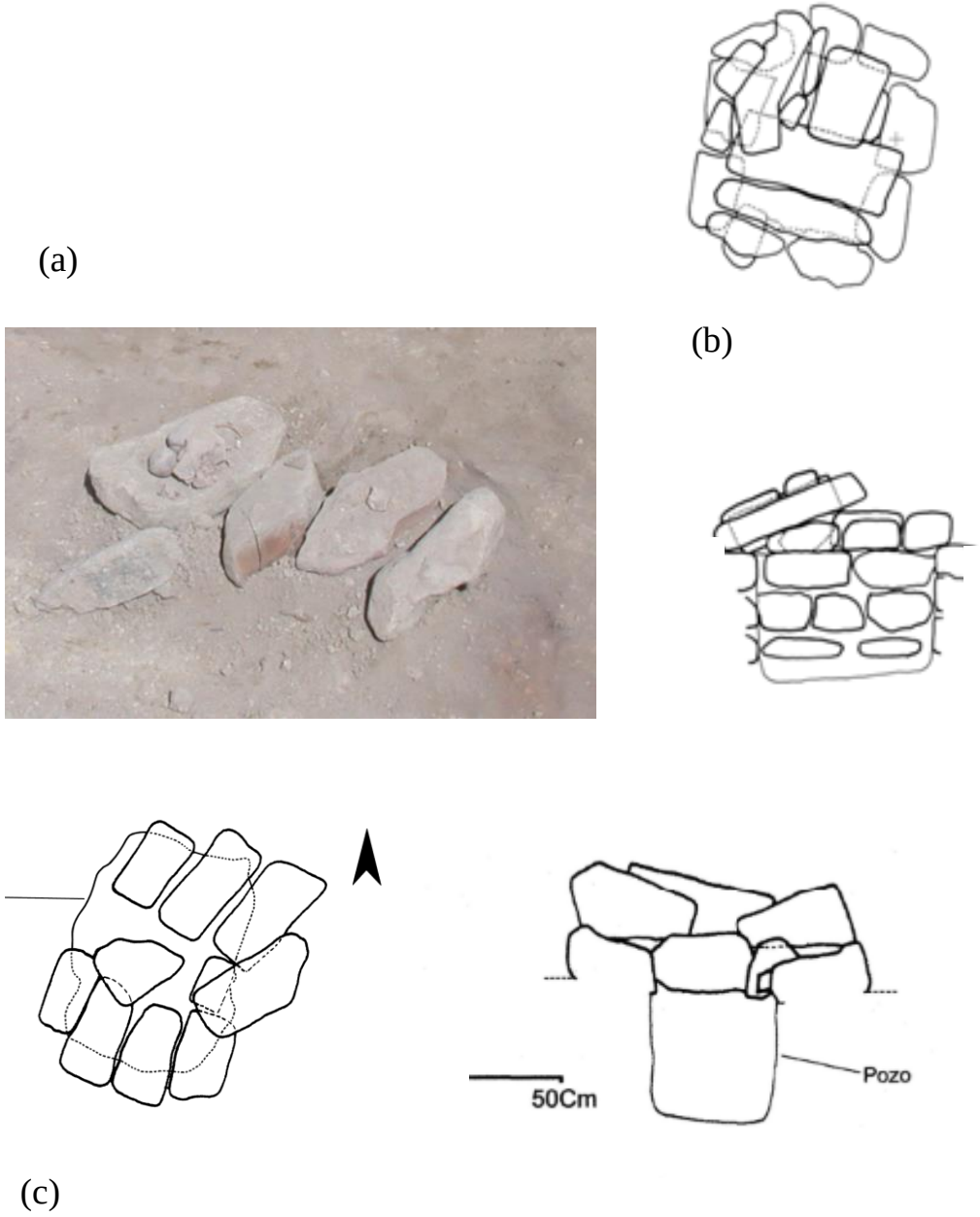


Figure 6.16. Variations in stone roof construction: (a) upper left photo, parallel slabs across tomb opening (CF-19); (b) two upper right drawings, parallel slabs over one half of tomb opening and tilted perpendicular slabs over other half (CF-45); (c) corbel vault roof slabs; on lower left, rectangular (CF-3) and on lower right, round (CF-45). Both perpendicular and corbel types produce an elevated tomb roof.

Figure 6.17. White powder and white fibers found in burials. The white powder is possibly the remains of textiles and the fibers possibly of basket or mat wrappings. Top photo from CF-1, bottom right from CF-27 and bottom left from CF-38.

Figure 6.18. Remains of likely baskets, ropes or plant fiber mats. Top photo from CF-27, bottom photo from CF-28.

Figure 6.19. Example of short grass fibers found densely packed around offering vessels in CF-27.

Figure 6.20. Examples of papery tree bark remains found in burials from CF-27 (top) and CF-36 (bottom). The bark is likely from the *Polylepsis* tree.

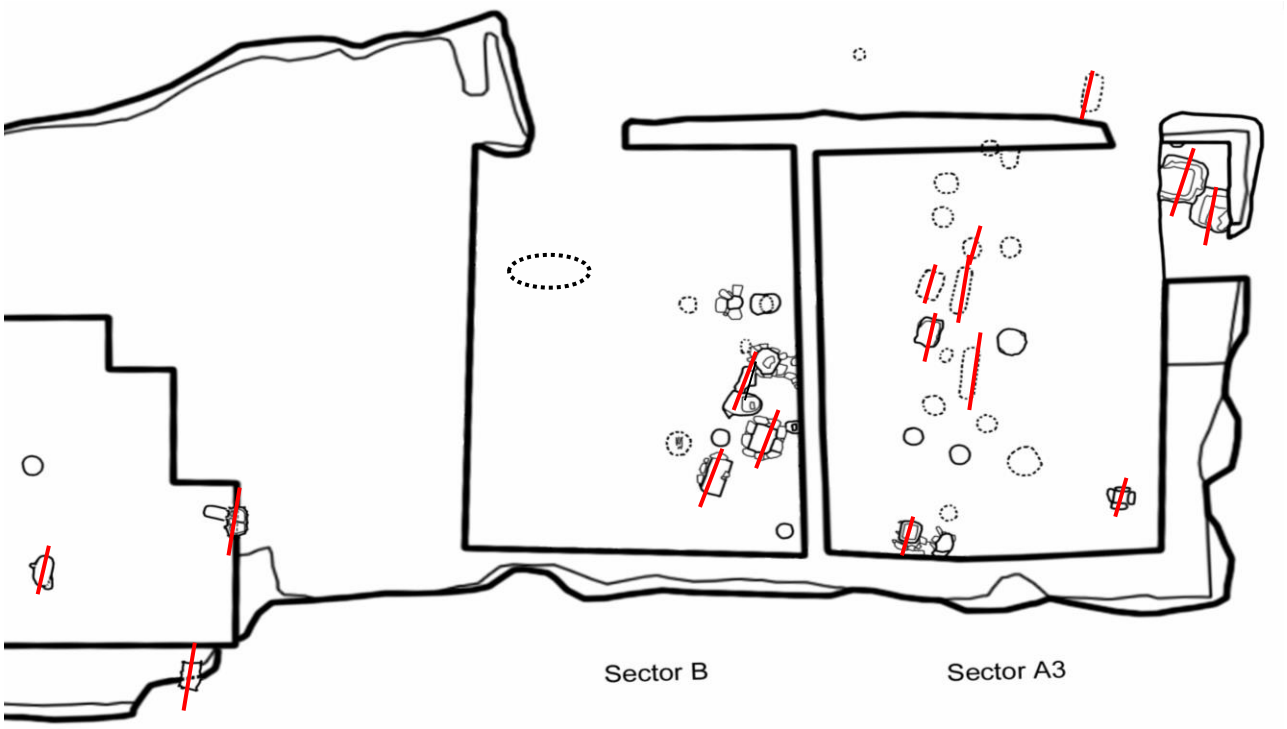
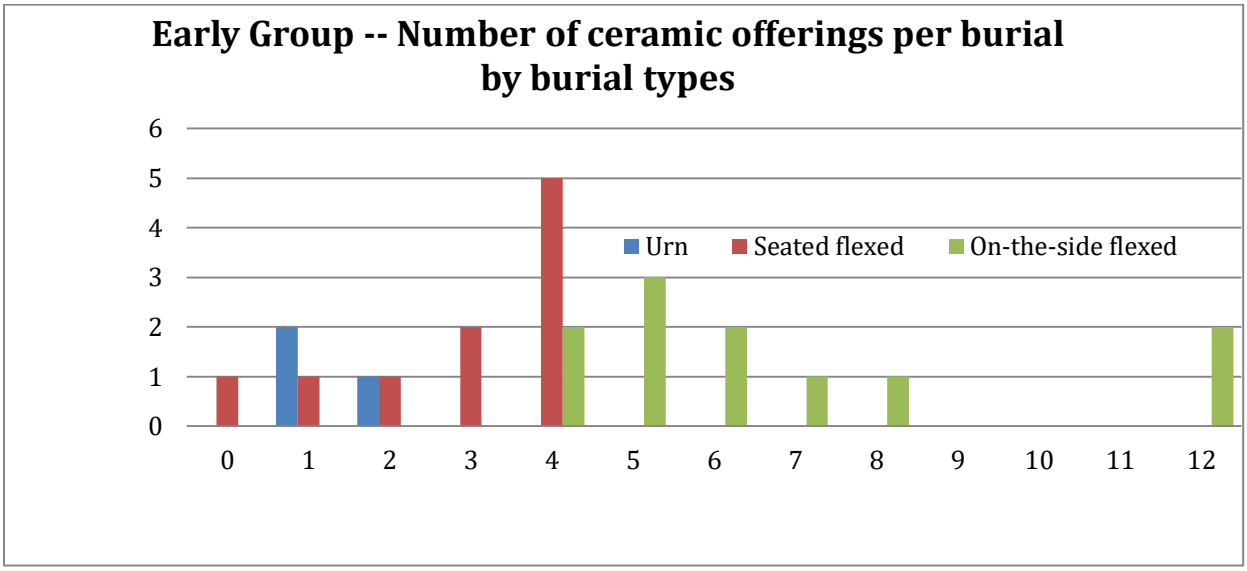


Figure 6.21. Orientation of rectangular and oval burials showing general east of north orientation.



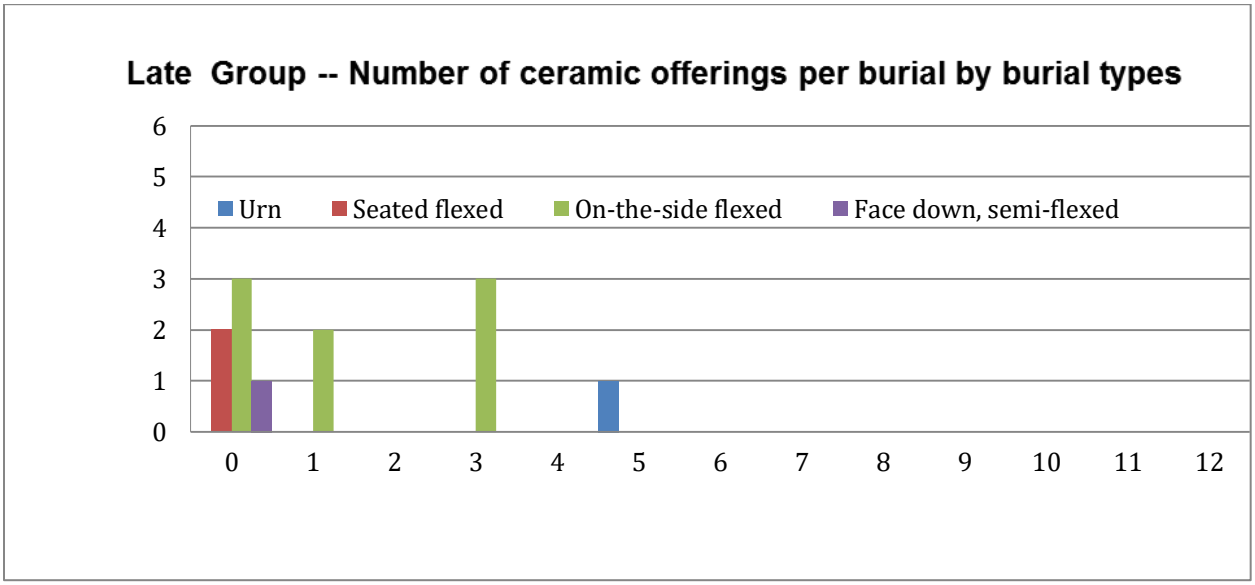


Figure 6.22. Number of ceramic offerings per burial by burial type. Note that in the Early Group there is an apparent correlation between body position and number of offerings in each gravelot. The seated flexed burials had 0 to 4 offerings (average 2.8) and on-the-side flexed had 4 to 12 offerings (average 6.7). By the Late Group, seated flexed burials had no offerings and on-the-side flexed burials dropped to a range of 0 to 3 (average 1.4).

Figure 6.23. Pinchpots and unfired formed vessels.

Figure 6.24. Unfired miniature vessels found in *tazón* in CF-10a. From left to right, the forms are a *tazón*, a tripod *tazón*, a *vasija*, a *vaso embudo*, an *incensario*, and two *ollas*/*tinajas*. The assortment of vessels includes both characteristic local forms (the tripod *tazón* and the *vaso embudo*) and characteristic Tiwanaku forms (the *incensario*).

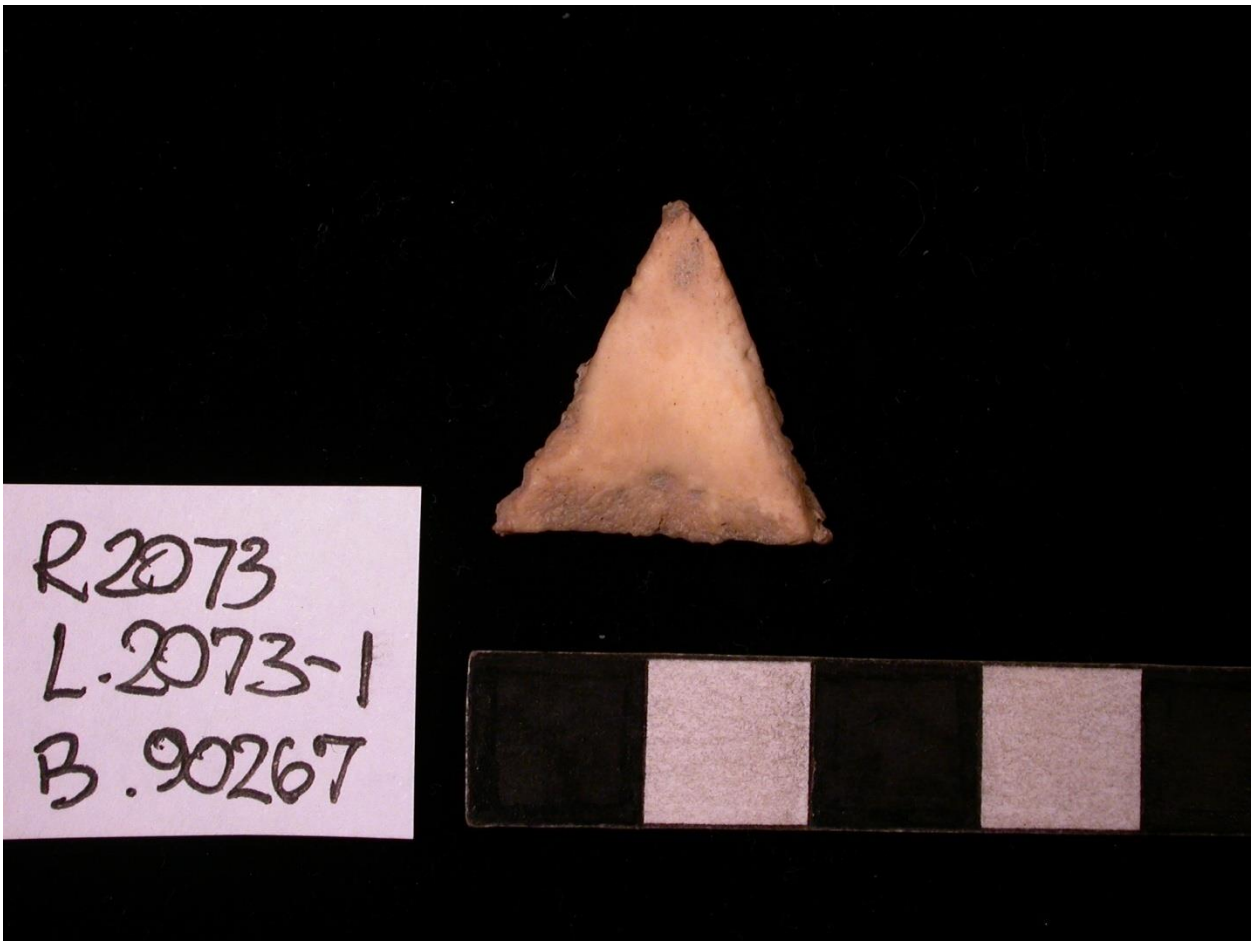


Figure 6.25. Triangular worked camelid bone, possibly an ornament (CF-36).

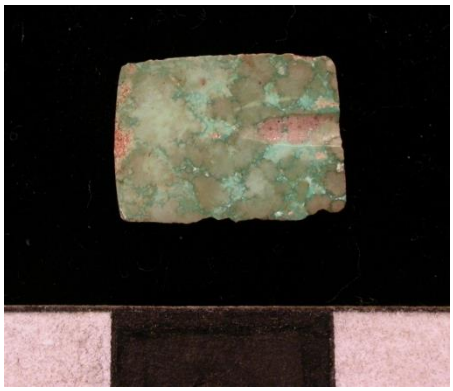


Figure 6.26. Set of malachite beads found in higher status burials, CF-27 and CF-36.

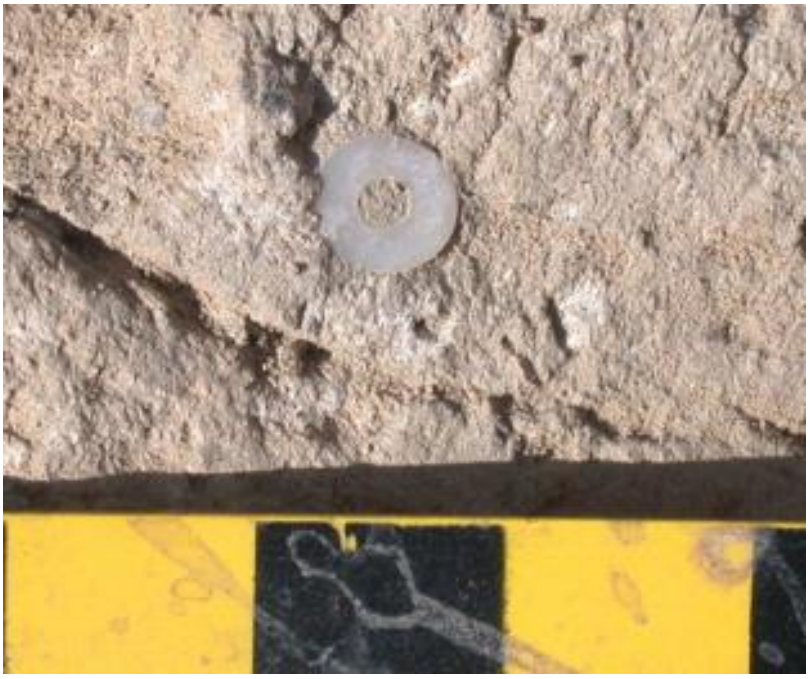


Figure 6.27. White shell bead from base of CF-9. Bead may not be directly associated with the burial.

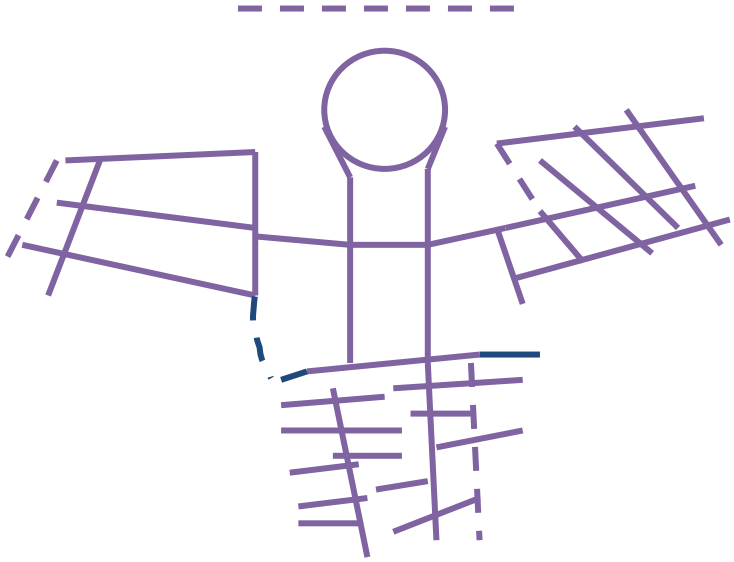


Figure 6.28. Silver plaque from CF-36. Below is a drawing of the etched design, possibly representing a bird with wings outspread, found on the plaque.

Figure 6.29. Sole offering vessel with intact food remains. The vessel was sealed with a plug of red clay at the rim (marked by arrow). Vessel is of unknown style and has the imprints of a circular woven mat on the base, which is rare in the Cochabamba Central Valley. The food consisted of the remains of a variety of meat types.

Figure 6.30. Burned material found in unfired pinchpot, CF-29 (upper photo), and imported Tiwanaku *incensario,* CF-11 (lower photo).

Figure 6.31. Maize leaves used as wrapping for imported Tiwanaku redware *kero* in CF-27 (above) and imported Tiwanaku blackware *kero* CF-36 (below). Maize leaves were not found wrapping any other vessel type.

Figure 6.32. Types of cranial deformation found at Piñami. On left, example of fronto-occipital cranial deformation from CF-11. On right, example of annular cranial deformation from CF-18. Both are from Early Group burials.

Figures for Chapter 7

Figure 7.1. Illataco Phase wall and platform. The edge of the wall is outlined by a dashed white line. The darker earth to the left is the remains of the platform fill.

Figure 7.2. Late Piñami Phase agglutinated architecture. Structure 1, Sector C.

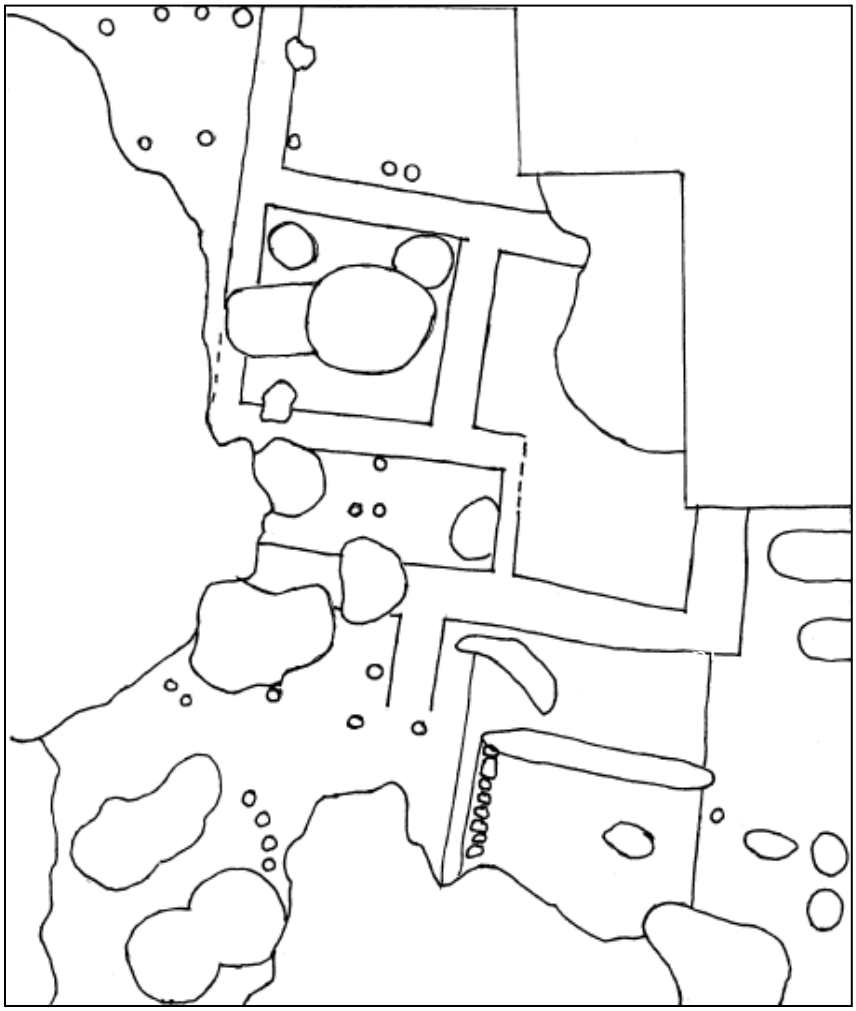


Figure 7.3. Structure 1 and features from Late Piñami Phase. Substantial changes in layout occurred over time, but key walls remained intact.

Figure 7.4. Late Piñami Phase small room from Sector A-1. Possible small gutter or canal to the south of the room shown in plan view (above) and cross-section (below).

Figure 7.5. Example of orientation in domestic architecture.

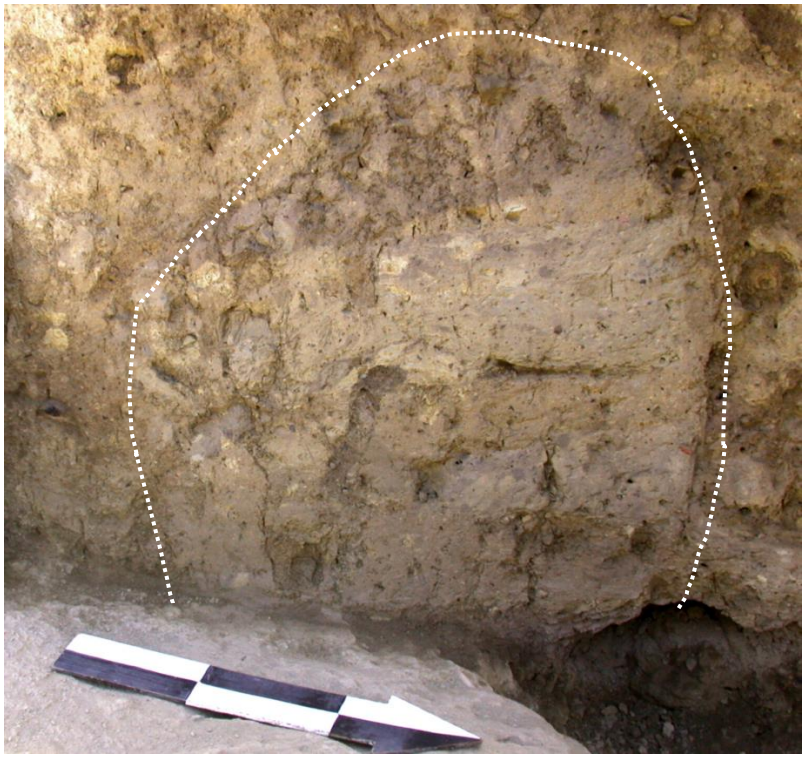


Figure 7.6. Cross-section of wall showing variable thicknesses and clay colors of *tapia* layers.

Figure 7.7. Double course cobblestone foundation for a wall. This was the only stone foundation for a wall we found in our Piñami excavations.

Figure 7.8. *Tapia* walls placed directly over ash deposits.

Figure 7.9. Variation in adobe brick shapes and sizes. Some adobes had one side purposely rounded.

Figure 7.10. Variation in adobe brick shapes and sizes. Adobe bricks with all squared corners.

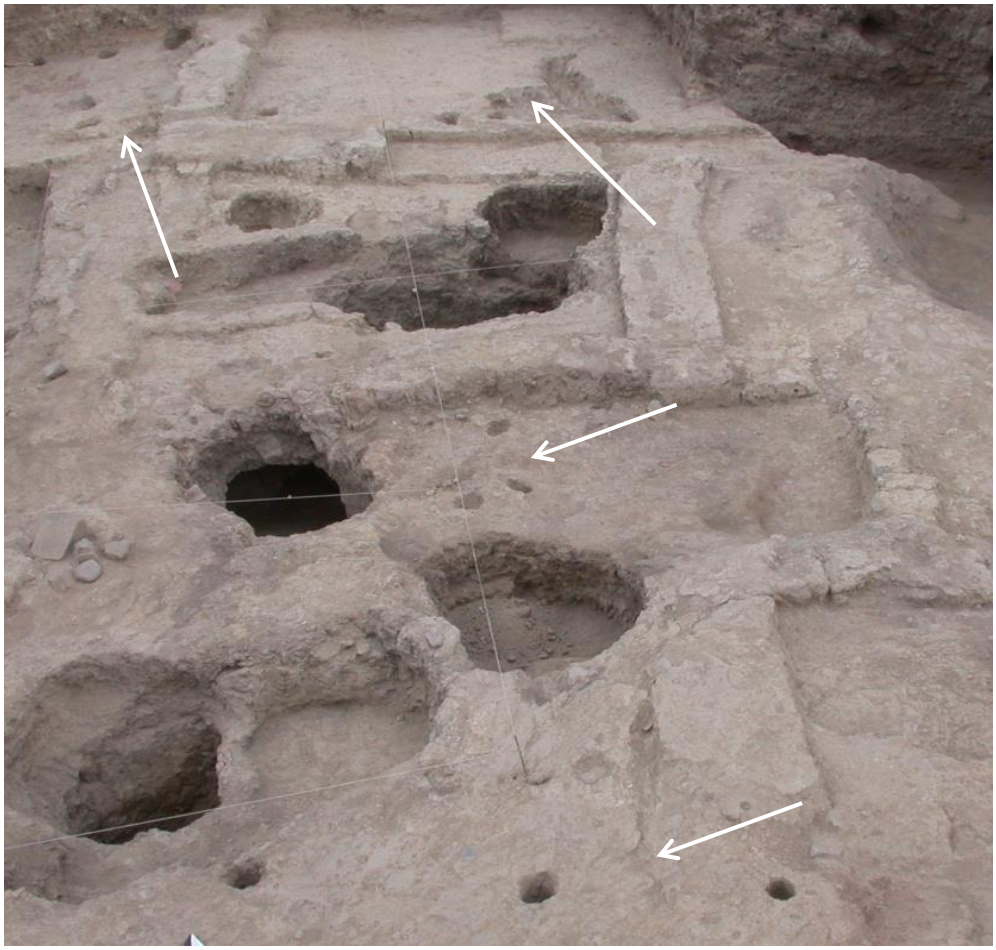


Figure 7.11. Postholes from Structure 1, Sector C.

Figure 7.12. Architectural clay (daub). Examples show clear imprints of grass. The thin edges and non-round shapes are inconsistent with pottery forms. Below is a single sherd seen from two angles.

Figure 7.13. Architectural clay showing probable cane imprints. Top photos are two views of a fragment of daub; one side is flat and the other side peaks in the middle and has two parallel rounded depressions that would fit parallel stalks of cane. Lower left photo also shows a cane-shaped indentation. Below right is a modern building from Cuzco, Peru showing the use of cane with daub.

Figure 7.14. Platform 2. Above, remnant of Platform 2 made of adobes. This platform, approximately 25 cm high and at least 1 m wide by 1.5 m long, was possibly originally a sleeping platform but ended its use life as a hearth, below.

Figure 7.15. Hearth A--Typical hearth with built-up adobe rim, contemporaneous with Hearths C and D, Structure 1.

Figure 7.16. Traditional hearth showing how pots could be placed for cooking. This hearth was made near our excavation site by Quechua team members as part of an experiment on the carbonization of maize. It shows the adobe walls and support for pots.

Figure 7.17. Hearth B--Large flat outdoor hearth, Structure 1. Area within the circle had dense ash and burned areas.

Figure 7.18. Hearth C--Large hearth on room floor of Structure 1. Dotted line surrounds hearth area after excavation. This area was lined with layers of utilitarian sherds and ash.

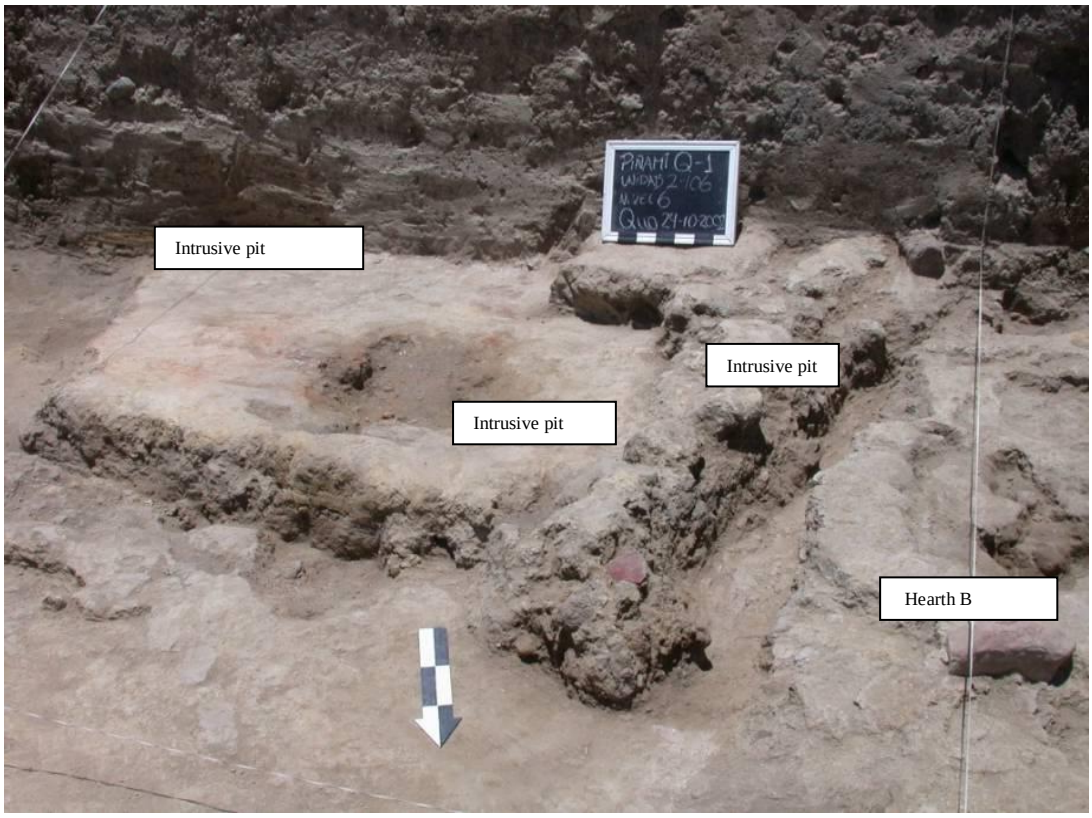


Figure 7.19. Hearth A and Hearth D with remains of the dividing wall between them.

Figure 7.20. Bell-shaped storage pits of various sizes. The top photo shows a bell-shaped pit that is over 2.5 meters deep. The bottom photo shows a bell-shaped pit .9 meter deep.

Figure 7.21. Cylindrical storage pits. The pit in the center is the largest cylindrical pit found at Piñami. It was 2 meters deep.

Figure 7.22. Large amorphous borrow/ash pit.

Figure 7.23. Two views of Clean Room, Structure 1, Sector C. In Sector C we found a room that had a pale yellow clay floor that was clean of debris or artifacts. The flooring was carefully poured and smoothed and was thicker than in other rooms. This room was refloored once in the same manner with the same distinctive light color clay. Clean rooms have been found in various structures at Tiwanaku and are considered to be ceremonial spaces (Janusek 2004:110-112). No similar rooms have been encountered as yet in pre-Tiwanaku habitation in Cochabamba.

Figure 7.24. Camelid dedicatory offering. A camelid jawbone was found in an oval pit located within a longer canoe-shaped pit under a wall. The deeper hole in the center is from a pre-existing pit feature.

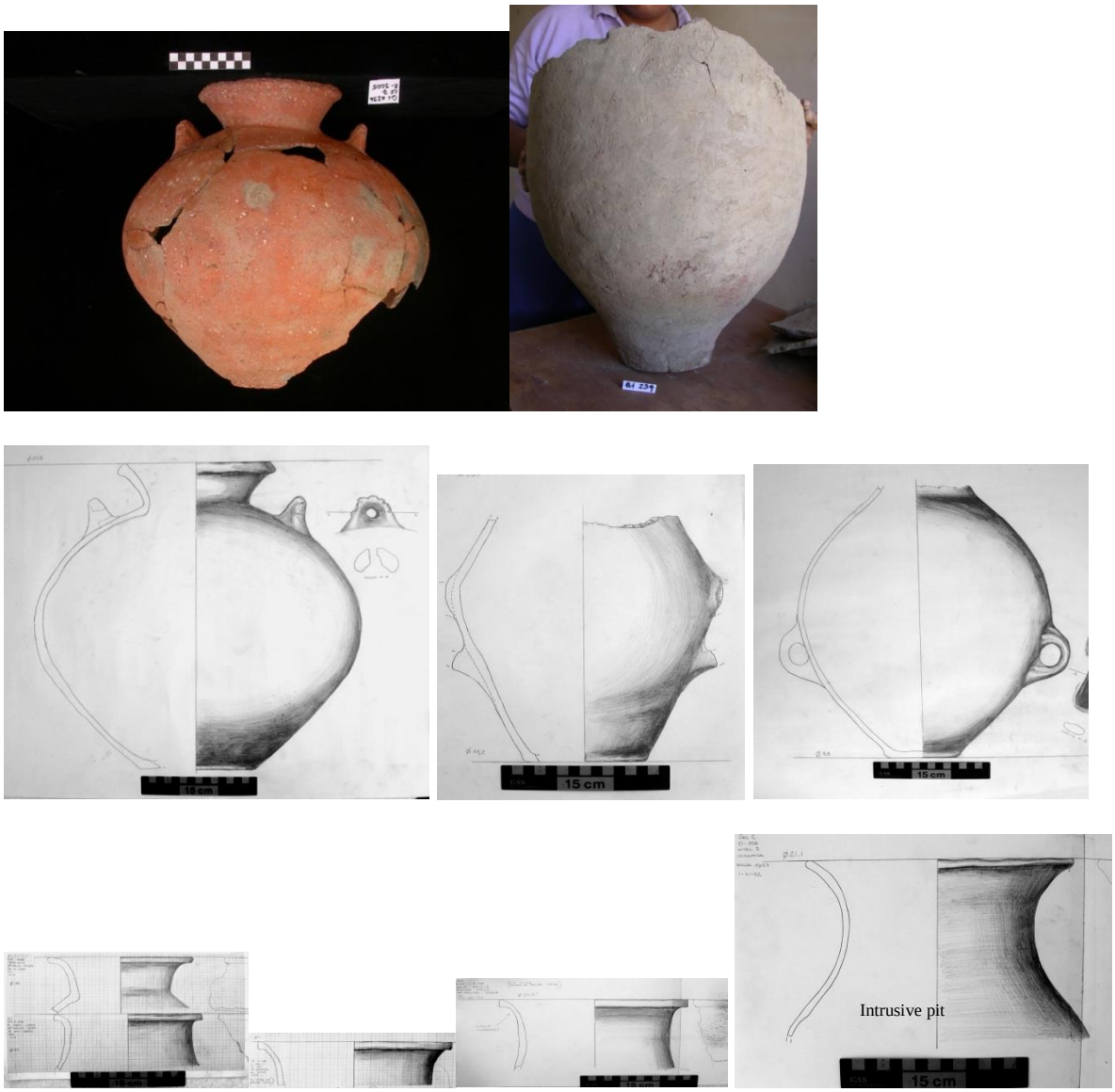


Figure 7.25. *Tinajas*. Storage jars. *Tinajas* could be heart-shaped or globular. Some had handles, typically in pairs placed horizontally on the upper shoulder or vertically in the lower third of the vessel.

Figure 7.26. *Vasijas*. These are small undecorated vessels with narrow necks and slightly flaring rims. *Vasijas* come in three varieties: without handles (two left images), with single handle from the rim to the shoulder (center) or with two small handles starting and ending on the shoulder (two right images).

Figure 7.27. *Ollas*. Standard cooking pots with two parallel rim-to-shoulder vertical handles. Most *ollas* were encrusted with carbon, indicating they had been placed in or over a fire.

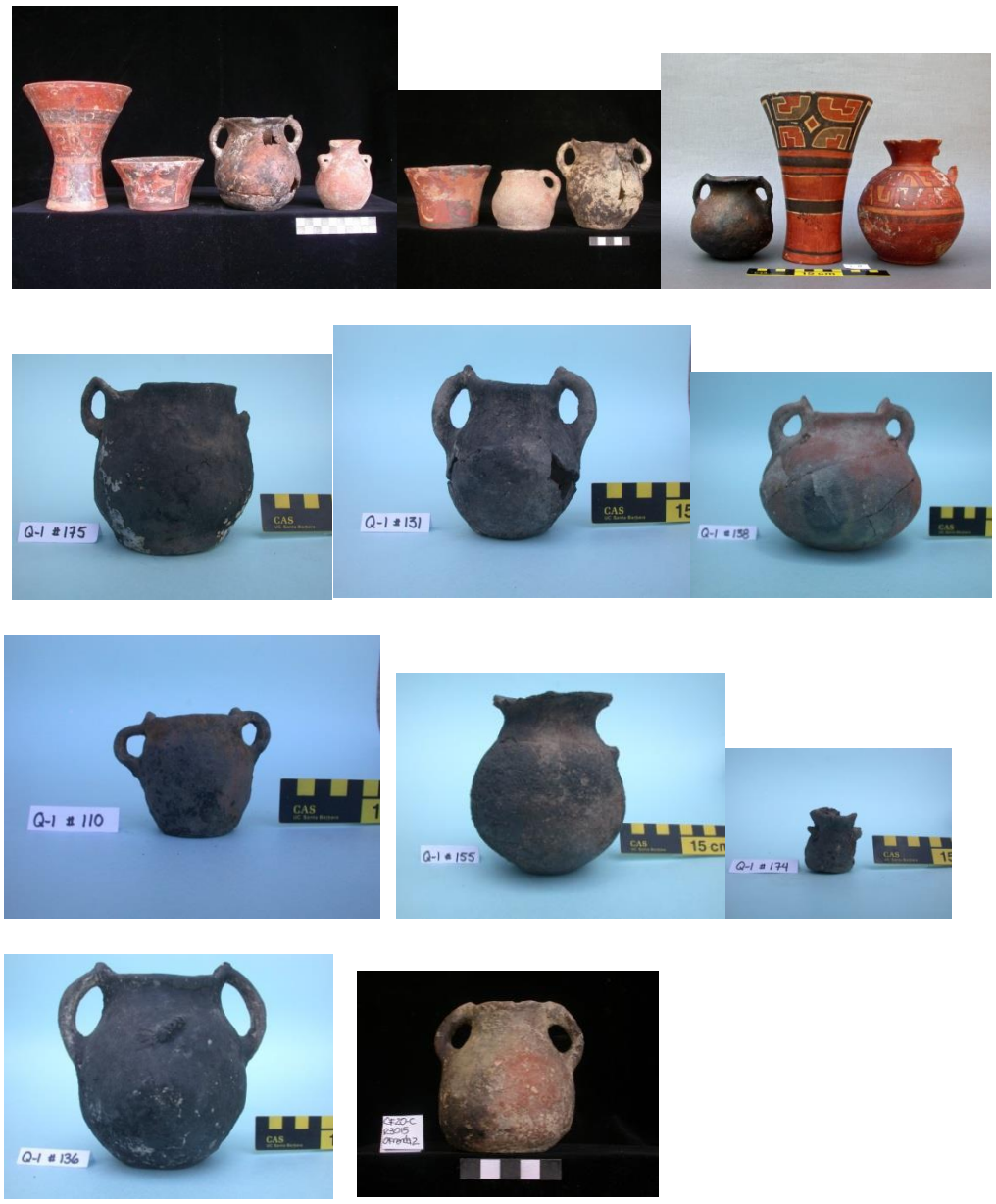


Figure 7.28. *Ollitas.* Small cooking pots with two vertical handles from rim (or somewhat above rim) to shoulder. *Ollitas* were the most common utilitarian form found as burial offerings. Top three photos show *ollitas* as part of a gravelot. *Ollitas* were clearly placed in the fire, as most were completely covered with carbon.

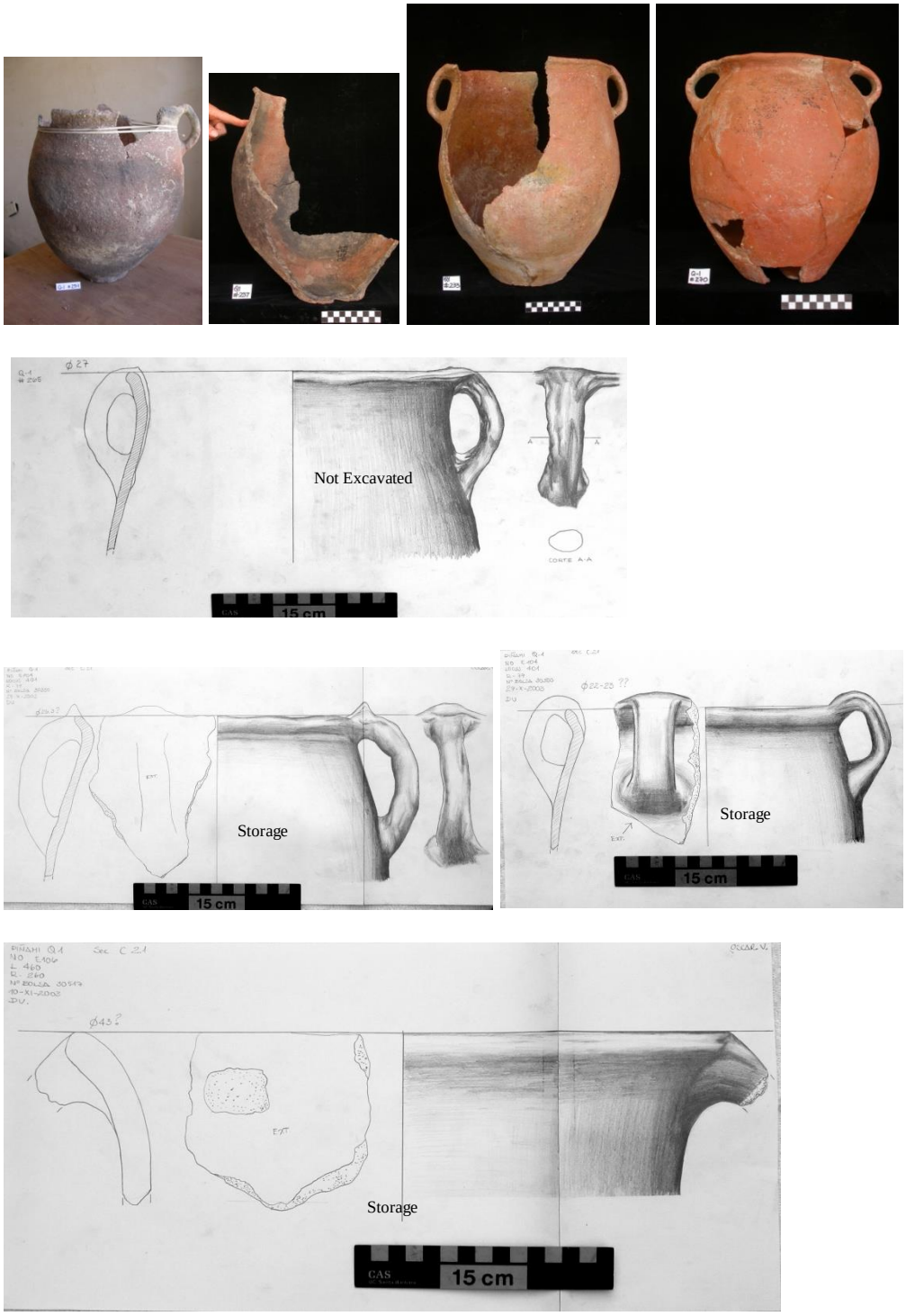


Figure 7.29. Wide mouth *ollas*/fermentation vessels, possibly associated with *chicha* production. Rim diameters typically range from 21 cm to 31 cm, though some can be substantially larger, up to 43 cm in diameter. Most have vertical rim-to-shoulder handles, though occasionally there are horizontal shoulder handles.

Figure 7.30. Painted designs on utilitarian ceramics were rare. Paint strokes were wide and quickly executed as compared with servingware painted designs.

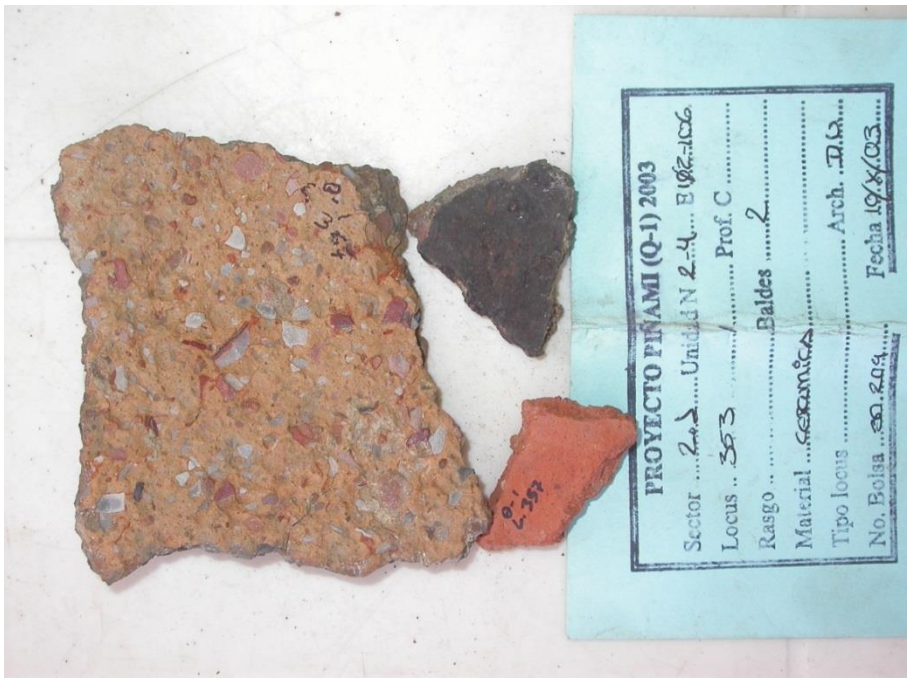


Figure 7.31. Utilitarian sherds showing the most diagnostic Central Valley temper for utilitarian vessels. This temper used large pieces of red and/or gray shale, producing a noticeable speckled appearance on the surface even if a colored wash was applied over the surface.

Figure 7.32. Concentration of red shale pieces from the Early Piñami Phase.

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Figure 7.33. Carbon encrusted on the exterior of cooking vessels.

Figure 7.34. Stone *trompos.*

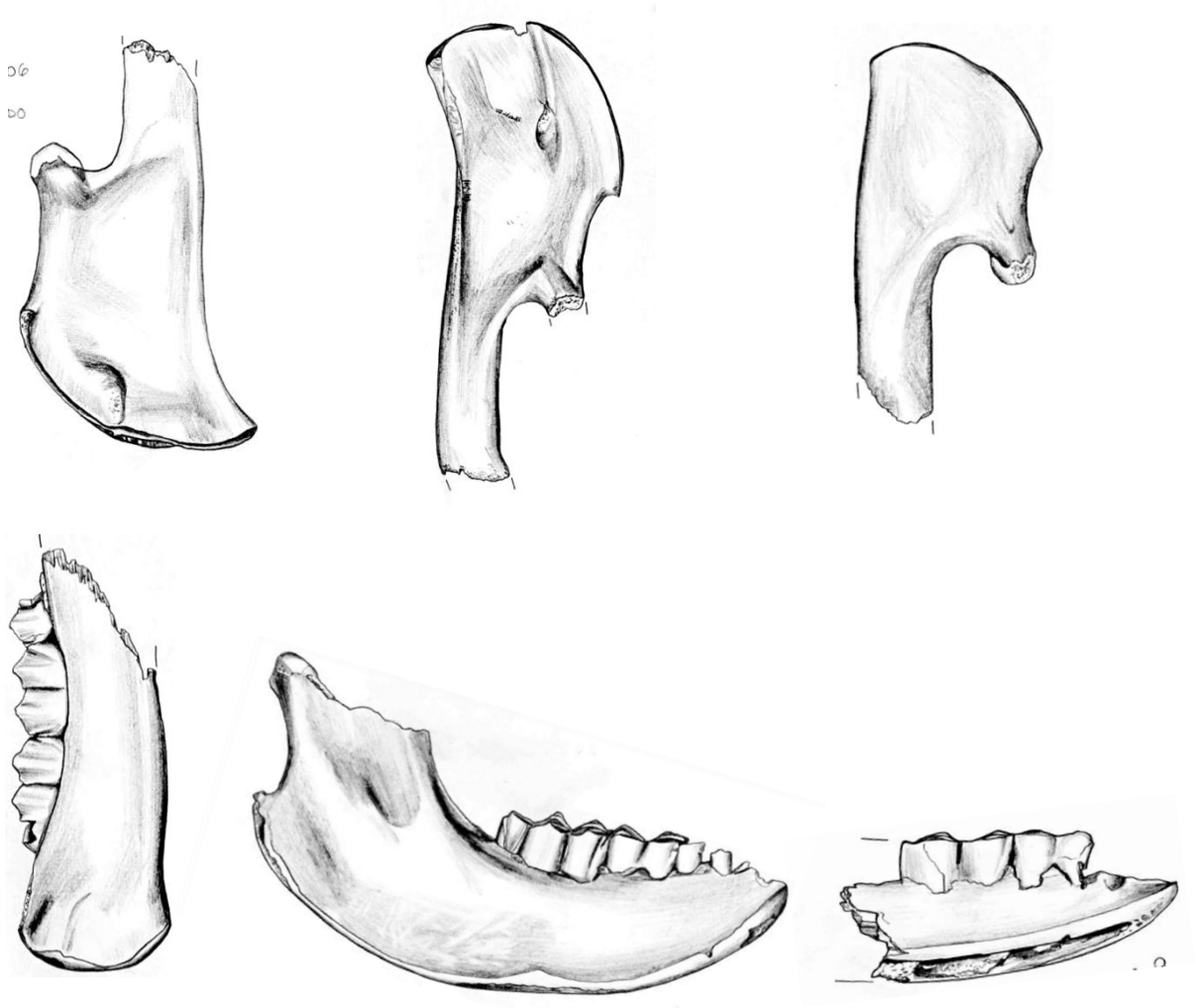

Figure 7.35. Middle Horizon camelid mandible tools showing variable scraping surfaces. On the top are examples with scraping surfaces similar to those found at the Tiwanaku capital and other Tiwanaku sites. On the bottom are mandible tools with scraping surfaces not typical of Tiwanaku.

Figure 7.36. Bone ritual snuff spoons and spatulas and other bone adornments.

Figure 7.37. Bone hallucinogenic snuff spoon with clenched fist handle.

Figure 7.38. Bone flutes from Early to Late Piñami Phase occupations.

Figure 7.39. Bone weaving tools, including *wichuñas*, awls, needles and hooks.

Figure 7.40. Stone spindle whorls from the Late Piñami Phase. The one on the left is 4 cm in diameter. The one on the right is approximately 9 cm in diameter.

Figure 7.41. Hand stones (*manos*) used for grinding.

Figure 7.42. Bone saws made from camelid scapula.

Figure 7.43. Copper implements.

Figure 7.44. Stone projectile points. The ones in ovals are from Middle Horizon contexts. The others are from Late Intermediate contexts.

Figure 7.45. Camelid bone projectile points.

Figure 7.46. Profile (above) and cross-section (below) of portion of stone axe found in the Late Piñami Phase.

Figure 7.47. Faunal evidence of animal food sources, including camelid, bird, rodent and fish.

Figure 7.48. Carbonized maize cobs and kernels.

REFERENCES CITED

Alconini Mujíca, Sonia

1993 La cerámica de la Pirámide Akapana y su contexto social en el estado de Tiwanaku. Licenciatura thesis, Department of Anthropology-Archaeology, Universidad Mayor de San Andrés, La Paz.

Allen, Catherine

2009 "Let's Drink Together, My Dear!": Persistent Ceremonies in a Changing Community. In *Drink, Power and Society in the Andes*, edited by Justin Jennings and Brenda J. Bowser. University Press of Florida, Gainesville.

2002 *The Hold Life Has: Coca and Cultural Identity in an Andean Community*. 2nd ed. Smithsonian Institution Press, Washington, D.C.

Anderson, Karen

1997 The Omereque Style of South Central Bolivia. Master's paper. Department of Anthropology, University of California, Santa Barbara.

1999 Tiwanaku Political Economy: The View from Cochabamba. Paper presented at the 64th Annual Meeting of the Society for American Archaeology, Chicago, Illinois.

2004 Tiwanaku Expansion in the South Central Andes: Results from Recent Excavations at Piñami. Paper presented at the 2004 Annual Meeting of the Institute of Andean Studies, Berkeley, California.

2006 Tiwanaku Impact on the Cochabamba Region: Household Evidence from Piñami. Paper presented at the 71st Annual Meeting of the Society for American Archaeology, San Juan, Puerto Rico.

2009 Tiwanaku Influence on Local Drinking Patterns in Cochabamba, Bolivia. In *Drink, Power and Society in the Andes*, edited by Justin Jennings and Brenda J. Bowser, pp. 167-199. University Press of Florida, Gainesville.

2010 Late Formative through Late Horizon Occupation Patterns in the Central Valley of Cochabamba. Paper presented at the 75th Annual Meeting of the Society for American Archaeology, St. Louis, Missouri.

2012 Developments in Tiwanaku Chronology: New Radiocarbon Dates from Piñami, Cochabamba. Poster presented at the 69th Annual Meeting of the Society of American Archaeology, Memphis, Tennessee.

2013 Tiwanaku Influence on the Central Valley of Cochabamba. In *Visions of Tiwanaku*, Monograph 78, edited by Alexei Vranich and Charles Stanish, pp. 87-112. Cotsen Institute of Archaeology Press, University of California Los Angeles, Los Angeles.

2015 Transformation and Continuity: Late Tiwanaku to Post Tiwanaku Traditions in the Central Valley of Cochabamba. Paper presented at the 80th Annual Meeting of the Society for Americn Archaeology, San Francisco, California.

2018 The Tiwanaku Style in Cochabamba: How "Derived" Was It? In *The Southern Andean Iconographic Series*, edited by William Isbell, Mauricio Uribe, Anne Tiballi and Edward Zegarra, pp. 239-274. Cotsen Institute of Archaeology Press, University of California Los Angeles, Los Angeles.

Anderson, Karen, and Ricardo Céspedes Paz
1998 Tiwanaku and the Local Effects of Contact: The Late Formative to Middle Horizon Transition in Cochabamba, Bolivia. Paper presented at the 63rd Annual Meeting of the Society for American Archaeology, Seattle, Washington.

Atalay, Sonya and Christine Hastorf
2006 Food, Meals, and Daily Activities: The Habitus of Food Practices at Neolithic, Çatalhöyük. *American Antiquity* 71:283-319.

Bennett, Wendell C.
1934 Excavations at Tiahuanaco. *Anthropological Papers of the American Museum of Natural History* 35:359-494.
1936 Excavations in Bolivia. *Anthropological Papers of the American Museum of Natural History* 35:329–507.

Bermann, Marc
1990 Prehispanic Household and Empire at Lukurmata, Bolivia.PhD dissertation, Department of Anthropology, University of Michigan, Ann Arbor.
1994 *Lukurmata: Household Archaeology in Prehispanic Bolivia*. Princeton University Press, Princeton.
2003 The Archaeology of Households in Lukurmata. In *Tiwanaku and Its Hinterland: Archaeology and Paleoecology of an Andean Civilization* Vol. 2, edited by Alan L. Kolata, pp. 327–340. Smithsonian Institution Press, Washington, D.C.

Blanton, Richard E.
1998 Beyond Centralization: Steps Toward a Theory of Egalitarian Behavior in Archaic States. In *Archaic States*, edited by Gary M. Feinman and Joyce Marcus, pp. 135–172. School of American Research Press, Santa Fe.

Blanton, Richard E., S. A. Kowalewski, G. M. Feinman, and P. N. Peregrine
1996 A Dual-Processual Theory for the Evolution of Mesoamerican Civilization. *Current Anthropology* 37:1–14.

Blom, Deborah
1999 *Tiwanaku Regional Interaction and Social Identity: A Bioarchaeological Approach*. PhD dissertation, Department of Anthropology, University of Chicago, Chicago.

Blom, Deborah and Matthew S. Bandy
1999 Human Remains and Mortuary Analysis. In *Early Settlement at Chiripa, Bolivia: Research of the Taraco Archaeological Project*, edited by C. A. Hastorf, pp. 117-

122 and 133-136. Contributions of the University of California Archaeological Research Facility No. 57. University of California Archaeological Facility, Berkeley.

Bowser, Brenda
2000 From Pottery to Politics: An Ethnoarchaeological Study of Political Factionalism, Ethnicity, and Domestic Pottery Style in the Ecuadorian Amazon. *Journal of Archaeological Method and Theory* 7:219-248.
2002 The Perceptive Potter: An Ethnoarchaeological Study of Pottery, Ethnicity, and Political Action in Amazonia. PhD dissertation, Department of Anthropology, University of California, Santa Barbara.
2004 Prologue: Toward an archaeology of place. *Journal of Archaeological Method and Theory* 11:1-3.

Bowser, Brenda J., and John Q. Patton
2004 Domestic spaces as public places: An ethnoarchaeological case study of houses, gender, and politics in the Ecuadorian Amazon. *Journal of Archaeological Method and Theory* 11:157-181.

Bray, Tamara
2003 Imperial Pottery, Commensal Politics, and the Inca State. In *The Archaeology and Politics of Food and Feasting in Early States and Empires*, edited by Tamara L. Bray, pp. 93–142. Kluwer Academic/Plenum Publishers, New York.

Brockington, Donald L., David M. Pereira Herrera, Ramón Sanzetenea Rocha, and Maria de los Angeles Muñoz Collazos
1995 *Estudios arqueológicos del Período Formativo en el sur-este de Cochabamba.* Serie Arqueología 8. Instituto de Investigaciones Antropológicas, Universidad Mayor de San Simón, Cochabamba.

Brockington, Donald L., David. M. Pereira Herrera, Ramón Sanzetenea Rocha, Ricardo Céspedes Paz, and Carlos Perez L.
1985 *Informe preliminar de las excavaciones arqueológicas en: Sierra Mokho y Chullpa Pata (Período Formativo).* Serie Arqueología 5. Instituto de Investigaciones Antropológicas, Universidad Mayor de San Simón, Cochabamba.

Browman, David
1978 Toward the Development of the Tiwanaku state. In *Advances in Andean Archaeology*, edited by David L. Browman, pp. 327-49. Mouton, The Hague.

Burkholder, Jo Ellen
1997 Tiwanaku and the Anatomy of Time: A New Ceramic Chronology from the Iwawi Site, Department of La Paz, Bolivia. PhD dissertation, Department of Anthropology, State University of New York, Binghamton.

Byrne de Caballero, Geraldine

1984 El Tiwanaku en Cochabamba. *Arqueología Boliviana* 1:67–72.

Céspedes Paz, Ricardo
1982 *La cerámica Incaica en Cochabamba.* Serie Arqueología No. 1.. Instituto de Investigaciones Antropológicas, Universidad Mayor de San Simón Cochabamba.
2000 *Excavaciones Arqueológicas en Piñami*. Boletín de INIAN No. 9. Universidad Mayor de San Simón Cochabamba.

Céspedes Paz, Ricardo, Karen Anderson, and Ramón Sanzetenea
1994 *Report on the Excavation at the Parochial Building, Quillacollo, Bolivia.* Report submitted to the Instituto Antropológico y Museo Arqueológico, Universidad Mayor de San Simón, Cochabamba.

Chase-Dunn, C., and T. Hall (editors)
1991 *Core/Periphery Relations in Precapitalist Worlds*. Westview Press, Boulder.

Conklin, William J.
2004a Color and Abstraction in Wari Weaving. In *Tiwanaku: Ancestors of the Inca*, edited by M. Young-Sánchez, pp. 180-181. Denver Art Museum and University of Nebraska Press, Lincoln and London,
2004b The Fire Textile. HALI 133:94-100.
2004c Shaped Tapestry Sash. In *Tiwanaku: Ancestors of the Inca*, edited by M. Young-Sánchez, pp. 86-87. Denver Art Museum and University of Nebraska Press, Lincoln and London.
2004d Wari Tunic. In *Tiwanaku: Ancestors of the Inca*, edited by M. Young-Sánchez, pp. 178-179. Denver Art Museum and University of Nebraska Press, Lincoln and London.

Cook, Anita G., and Mary Glowacki
2003 Pots, Politics, and Power: Huari Ceramic Assemblages and Imperial Administration. In *The Archaeology and Politics of Food and Feasting in Early States and Empires*, edited by Tamara L. Bray, pp. 173–202. Kluwer Academic/Plenum Publishers, New York.

Couture, Nicole
2002 The Construction of Power: Monumental Space and an Elite Residence at Tiwanaku, Bolivia. PhD dissertation, Department of Anthropology, University of Chicago, Chicago.

Couture, Nicole, and Kathryn Sampeck
2003 Putini: A History of Palace Architecture at Tiwanaku. In *Tiwanaku and Its Hinterland: Archaeology and Paleoecology of an Andean Civilization.* Vol. 2, edited by Alan L. Kolata, pp. 226–263. Smithsonian Institution Press, Washington, D.C.

Coyote Hills Nature Center
2008 *Exhibit, Ohlone Indians*, Coyote Hills Regional Park, Fremont, California.

Deagan, Kathleen, and José María Cruxent
2002 *Archaeology at La Isabela: America's First European Town*. Yale University Press, New Haven.

Dietler, Michael
1990 Driven by Drink: The Role of Drinking in the Political Economy and the Case of Early Iron Age France. *Journal of Archaeological Anthropology* 9:352–406.
2001 Theorizing the Feast: Rituals of Consumption, Commensal Politics, and Power in African Contexts. In *Feasts: Archaeological and Ethnographic Perspectives on Food, Politics, and Power*, edited by Michael Dietler and Brian Hayden, pp. 65-114. Smithsonian Institution Press, Washington, DC.
2003 Clearing the Table: Some Concluding Reflections on Commensal Politics and Imperial States. In *The Archaeology and Politics of Food and Feasting in Early States and Empires*, edited by Tamara Bray, pp. 271–282. Kluwer Academic/Plenum Publishers, New York.

Deitler, Michael. and B. Hayden
2001 Digesting the Feast--Good to Eat, Good to Drink, Good to Think: An Introduction. In *Feasts: Archaeological and Ethnographic Perspectives on Food, Politics, and Power*, edited by M. Deitler and B. Hayden, pp. 1-20. Smithsonian Institution Press, Washington DC.

Döllerer, Cristof
2004 Proyecto Tupuraya: informe preliminar sobre los trabajos arqueológicos y documentación de los estilos cerámicos Tupuraya y Sauces como los dos desarrollos tránsitos entre el Formativo y la Epoca Tiwanaku en Cochabamba, Bolivia. Report submitted to Instituto de Investigaciones Antropológicas y Museo Arqueológico Universidad Mayor de San Simón, Cochabamba.
2013 Siedlungsarchäologie von Cochabamba, Bolivien. PhD dissertation, Department of Philosophy, University of Rheinischen Friedrich-Wilhelms, Bonn.

Gabelmann, Olga
2005 Proyecto Santa Lucía 2003/04: Organización social, producción de cerámica e intercambio en el Período Formativo en el valle alto de Cochabamba. In *Jornadas Arqueológicas 2004*, edited by V. E. Salinas Camacho, pp. 51-73. Centro de Investigación Arqueológica, Universidad Mayor de San Francisco Xavier, Sucre Bolivia.
2008 Keramikproduktion in Santa Lucía: Ein Blick aud die "Peripherie" des Formativums im südzentralen Andenraum. PhD dissertation, Department of History and Cultural Studies, Freie Universität Berlin.

2012a A Changing Society? Craft Specialization and Complementarity Systems during the Formative Period in the Cochabamba Valley, Bolivia. *Andean Past* 10:27-67.
2012b Complejidad social y organizacion de la Produccion Artesenal durante El Periodo Formativo en el Valle Alta de Cochabamba. *Arqueoantropoloicas* 2(2):97-141.

Giesso, M.
2003 Stone Tool Production in the Tiwanaku Heartland. In *Tiwanaku and Its Hinterland: Archaeology and Paleoecology of an Andean Civilization* Vol. 2, edited by Alan L. Kolata, pp. 363–383. Smithsonian Institution Press, Washington, DC.

Goldstein, D. J., R. C. Coleman, and P. R. Williams
2009 Reconstructing Middle Horizon (500-1000 C.E.) Social Dynamics through Paleoethnobotanical Interpretations of Fermented Beverage Production and Consumption at Cerro Baúl, Moquegua, Perú. In *Drink, Power, and Society in the Andes*, edited Justin Jennings and Brenda J. Bowser, pp. 133-166. University Press of Florida, Gainesville.

Goldstein, Paul S.
1985 Tiwanaku Ceramics of the Moquegua Valley, Peru. Master's thesis, Department of Anthropology, University of Chicago, Chicago.
1989 Omo, A Tiwanaku Provincial Center in Moquegua, Peru. PhD dissertation, Department of Anthropology, University of Chicago, Chicago.
2003 From Stew-Eaters to Maize-Drinkers: The *Chicha* Economy and the Tiwanaku Expansion. In *The Archaeology and Politics of Food and Feasting in Early States and Empires*, edited by Tamara L. Bray, pp. 143–172. Kluwer Academic/Plenum Publishers, New York.
2005 *Andean Diaspora: The Tiwanaku Colonies and the Origins of South American Empire*. University Press of Florida, Gainesville.
2013 Tiwanaku and Wari State Expansion: Demographic and Outpost Colonization Compared. In *Visions of Tiwanaku*. Monograph 78, edited by Alexei Vranich and Charles Stanish, pp. 41-63. Cotsen Institute of Archaeology Press, University of California Los Angeles, Los Angeles.
2015 Multiethnicity, Pluralism, and Migration in the South Central Andes: An Alternate Path to State Expansion. *Proceedings of the National Academy of Sciences* 112:9202-9209.

Gosselain, Olivier
1992 Technology and Style: Potters and Pottery among Bafia of Cameroon. *Man* 27:559-586
1998 Social and Technical Identity in a Clay Crystal Ball. In *The Archaeology of Social Boundaries*, edited by Miriam T. Stark, pp. 78-106, Smithsonian Institution Press, Washington DC.

Hastorf, Christine A.
1991 Gender, Space and Food in Prehistory. In *Engendering Archaeology*, edited by J. Gero and M. Conkey, pp. 132-159. Basil Blackwell, Oxford.

Hastorf, Christine A., William T. Whitehead, Maria C. Bruno, and Melanie Wright
2006 The Movements of Maize into Middle Horizon Tiwanaku, Bolivia. In *Histories of Maize: Multidisciplinary Approaches to the Prehistory, Linguistics, Biogeography, Domestication and Evolution of Maize*, edited by John Staller, John Tykot, and Bruce Benz, pp. 429–448. Elsvier, Oxford.

Hayden, B.
2001 Fabulous Feasts: A Prolegomenon to the Importance of Feasting. In *Feasts: Archaeological and Ethnographic Perspectives on Food, Politics, and Power*, edited by M. Deitler and B. Hayden, pp. 23-64. Smithsonian Institution Press, Washington DC.

Hayashida, F.
2009 *Chicha* histories: Prehispanic *Chicha* Production in the Andes and the Use of Ethnographic and Historical Analogues. In *Drink, Power, and Society in the Andes*, edited by Justin Jennings and Brenda J. Bowser, pp. 232-256. University Press of Florida, Gainesville.

Higueras Hare, Alvaro
1996 Prehispanic Settlement and Land Use in Cochabamba, Bolivia. PhD dissertation, Department of Anthropology, University of Pittsburgh, Pittsburgh.

Honorable Municipalidad de Cochabamba
2005 *Plan de ordenamiento territorial del Municipio Cercado de Cochabamba—diagnostico*. Honorable Municipalidad de Cochabamba, Cochabamba.

Ibarra Grasso, Dick Edgar
1973 *Prehistoria de Bolivia*. 2nd ed. Los Amigos del Libro, La Paz.

Ibarra Grasso, Dick Edgar and Roy Querejazu Lewis
1986 *30.000 años de prehistoria en Bolivia*. Los Amigos del Libro, La Paz.

Janusek, John Wayne
1994 State and Local Power in a Prehispanic Polity: Changing Patterns of Urban Residence in Tiwanaku and Lukurmata, Bolivia. PhD dissertation, Department of Anthropology, University of Chicago, Chicago.
2002 Out of Many, One: Style and Social Boundaries in Tiwanaku. *Latin American Antiquity* 13:35–61.
2003a The Changing Face of Tiwanaku Residential Life: State and Local Identity in an Andean City. In *Tiwanaku and Its Hinterland: Archaeology and Paleoecology of an Andean Civilization* Vol. 2, edited by Alan L. Kolata, pp. 264–295. Smithsonian Institution Press, Washington, D.C.

2003b Vessels, Time, and Society: Toward a Ceramic Chronology in the Tiwanaku Heartland. In *Tiwanaku and Its Hinterland: Archaeology and Paleoecology of an Andean Civilization* Vol. 2, edited by Alan L. Kolata, pp. 30–89. Smithsonian Institution Press, Washington, D.C.

2004 *Identity and Power in the Ancient Andes: Tiwanaku Cities Through Time*. Routledge, New York.

2008 *Ancient Tiwanaku*. Cambridge University Press, Cambridge.

Kellner, Corina

2010 *Dietary Analysis of Cochabamba Individuals from the Early and Late Middle Horizon Using Stable Isotope Analysis of Bone Collagen*; Unpublished Report submitted to Karen Anderson.

Kessler, Michael

1995 Present and Potential Distribution of *Polylepis* (*Rosaceae*) Forests in Bolivia. In *Biodiversity and Conservation of Neotropical Montane Forests*, edited by S. P. Churchill, pp. 281–294. Botanical Garden Press, New York.

Kolata, Alan

1993 *The Tiwanaku: Portrait of an Andean Civilization*. Blackwell, Cambridge, Massachusetts.

2003 The Proyecto Wila Jawira Research Program. In *Tiwanaku and Its Hinterland: Archaeology and Paleoecology of an Andean Civilization* Vol. 2, edited by A. Kolata, pp. 3–17. Smithsonian Institution Press, Washington, D.C.

Korpisaari, Antti

2006 *Death in the Bolivian High Plateau: Burials and Tiwanaku Society*. BAR International Series 1536. Archaeopress, Oxford.

Korpisaari, Antti, J. Sagárnaga Meneses, R. Kesseli, and J. Bustamante

2003 Informe de las investigaciones arqueologicas realizadas en los cementerios Tiwanakotas de Tiraska y Qiwaya, Departamento de La Paz, en la Temporada de Campo del 2002. In *Reports of the Finnish-Bolivian Archaeological Project in the Bolivian Amazon* Vol. 2, edited by A. Siiriäinen and A. Korpisaari, pp. 73–95. Department of Archaeology, University of Helsinki, Helsinki.

Lechtman, Heather

1977 Style in Technology: Some Early Thoughts. In *Material Culture: Style, Organization, and Dynamics of Technology*, edited by H. Lechtman and R. S. Merrill, pp. 3-20. West Publishing, New York.

1988 Traditions and Styles in Central Andean Metalworking. In *The Beginning of the Use of Metals and Alloys*, edited by R. Maddin, pp. 344-78. MIT Press, Cambridge Massachusetts.

Lucas, Cristin

2012 People on the Move: Examining Tiwanaku State Expansion in the Cochabamba Valley through Strontium Isotope Analysis. Master's thesis, Department of Anthropology, Northern Arizona University, Flagstaff.

Margolin, Malcolm
1978 *The Ohlone Way: Indian Life in the San Francisco-Monterey Bay Area.* Heyday, Berkeley.

Money, Mary
1993 El tesoro de San Sebastian: una tumba importante de la cultura Tiwanaku. *Beiträge zur allgemeinen und vergleichenden Archäologie* 11:682–695.

Muñoz Collazos, Maria de los Angeles
1993 *El Intermedio Tardío en Cochabamba: Arqueología y Etnohistoria*. Escuela Nacional de Antropología e Historia, INAH, Mexico City.

Nordenskiöld, Erland
1953 *Investigaciones arqueologicas en la region fronteriza de Perú y Bolivia*, translated by Ponce Sanginés and Stig Rydén. Biblioteca Pacena, La Paz.

Oakland, Amy Sue
1986 Tiwanaku Textile Style, from the South Central Andes, Bolivia and North Chile. PhD dissertation, Department of Art History, University of Texas, Austin.

O'Brien, Tyler G.
2003 Cranial Microvariation in Prehistoric South Central Andean Populations: An Assessment of Morphology in the Cochabamba Collection, Bolivia. PhD dissertation, Department of Anthropology, Binghamton University, Binghamton.

Pärssinen, Martti
2005 Tiwanaku: una cultura y un estado andino. In *Pariti: isla, misterio y poder. el tesoro cerámico de la cultura Tiwanaku*, edited by Antti Korpissari and Martti Pärssinen, pp. 17–37. Producciones CIMA, La Paz.

Pereira Herrera, David M., and Donald L. Brockington
2005 *Mojocoya y Greyware: Interacción e intercambios ntre la Amazonia, Chaco y Andes.* Serie Arqueología 10. *Instituto de Investigaciones Antropológicas y Museo Arqueológico* Universidad Mayor de San Simón, Cochabamba.

Pereira Herrera, David M., Maria de los Angeles Muñoz Collazos, Ramón Sanzetenea Rocha, and Donald L. Brockington
1992 *Conchupata: Un Panteón Formativo Temprano en el Valle de Mizque*. Serie Arqueología 7., Instituto de Investigaciones Antropológicas y Museo Arqueológico, Universidad Mayor de San Simón Cochabamba.

Pereira Herrera, David M., Ramón Sanzetenea Rocha, and Donald L. Brockington

2001 Investigaciones del Proyecto Arqueológico Formativo en Cochabamba, Bolivia. *Textos Antropológicos* 13:167–182.

Ponce Sanginés, Carlos
1981 *Tiwanaku: Espacio, tiempo y cultura: Ensayo de síntesis arqueológica*. Los Amigos del Libro, La Paz.

Rice, Prudence M.
1987 *Pottery Analysis*: *A Sourcebook*. University of Chicago Press, Chicago.

Rivera Casanovas, Claudia
1994 Ch'iji Jawira: Evidencias sobre la producción de cerámica en Tiwanaku. Licenciatura thesis, Universidad Mayor de San Andrés, La Paz.
2003 Ch'iji Jawira: A case of Ceramic Specialization in the Tiwanaku Urban Periphery. In *Tiwanaku and its Hinterland: Archaeology and Paleoecology of an Andean Civilization* Vol. 2, edited by Alan Kolata, pp. 296-315. Smithsonian Institution Press, Washington DC.

Rydén, Stig
1959 *Andean Excavations. Tupuraya and Cayhuasi: Two Tiahuanaco Sites*. Monograph Series No. 6, vol. 2. Ethnographical Museum of Sweden, Stockholm.

Sagárnaga Meneses, J.A.
1995 *Metalistería suntuaria precolombina en el altiplano andino: Su descripción y una aproximación a su análisis e interpretación*. Licenciatura thesis, Universidad Mayor de San Andrés, La Paz.

Schreiber, Katharina
1992 *Wari Imperialism in Middle Horizon Peru*. Anthropological Papers of the Museum of Anthropology University of Michigan No. 87. University of Michigan, Ann Arbor.
2005 Imperial Agendas and Local Agency: Wari Colonial Strategies. In *The Archaeology of Colonial Encounters*, edited by Gil J. Stein, pp. 237-262. School of American Research Press, Sante Fe.

Shortman, E., and P. Urban
1994 Living on the Edge: Core-Periphery Relations in Ancient Southeastern Mesoamerica. *Current Anthropology* 35:401–430.

Stanish, Charles
1992 *Ancient Andean Political Economy*. University of Texas Press, Austin.
2003 *Ancient Titicaca: The Evolution of Complex Society in Southern Peru and Northern Bolivia*. University of California Press, Berkeley.

2013 What Was Tiwanaku? In *Visions of Tiwanaku*. Monograph 78, edited by Alexei Vranich and Charles Stanish, pp. 151-166. Cotsen Institute of Archaeology Press, University of California Los Angeles, Los Angeles.

Stark, Miriam, Mark D. Elson and Jeffery J. Clark
1998 Social Boundaries and Technical Choices in Tonto Basin Prehistory. In *The Archaeology of Social Boundaries*, edited by M. T. Stark, pp. 208-231. Smithsonian Institution Press. Washington D.C.

Stein, G. J.
1998 World System Theory and Alternative Modes of Interaction in the Archaeology of Culture Contact. In *Studies in Culture Contact: Interaction, Culture Change, and Archaeology*, edited by J. G. Cusick, pp. 220-255. Center for Archaeological Investigations Occasional Paper No. 25. Southern Illinois University, Carbondale.

Terceros Céspedes, Zulema and Karen Anderson
2007 Plants Remains and Mortuary Customs during the Middle Horizon in Cochabamba: The evidence from Piñami. Paper presented at the 72nd Annual Meeting of the Society for American Archaeology, Austin.

Vetters, Marianne and Hartmut Tschauner
1995 *Cronología, estructura decorativa e iconografía Tiwanaku: Un análisis de la cerámica procedente de Tiwanaku en la Colección Fritz Buck*, Unpublished report, La Paz, Bolivia.

Wachtel, Nathan
1982 The *Mitimas* of Cochabamba Valley: The Colonization Policy of Huayna Capac. In *The Inca and Aztec States, 1400–1800*, edited by George A. Collier, Renato I. Rosaldo, and John D. Wirth, pp. 199–235. Academic Press, New York.

Wallace, Dwight T.
1957 The Tiahuanaco Horizon Style in the Peruvian and Bolivian Highlands. PhD Dissertation, Department of Anthropology, University of California, Berkeley.

Walter, Heinz
1966 *Beiträge zur Archäologie Boliviens*. DieGrabungendesMuseums für Völkerkunde Berlinim Jahre1958.ArchäologischeStudien in den Kordilleren Boli-viens II: Verlag Dietrich Reimer, Berlin.

Washburn, Dorothy K.
1977 *A Symmetry Analysis of the Upper Gila Area Ceramic Design*, Papers of the Peabody Museum of Archaeology and Ethnology, Vol 68. Harvard University, Cambridge.

Webster, A. D., and J. W. Janusek
2003 Tiwanaku Camelids: Subsistence, Sacrifice and Social Reproduction. In *Tiwanaku and Its Hinterland: Archaeology and Paleoecology of an Andean Civilization* Vol. 2, edited by Alan L. Kolata, pp. 343–362. Smithsonian Institution Press, Washington, DC

Wright, Melanie F., Christine A. Hastorf, and Heidi A. Lennstrom
2003 Pre-Hispanic Agriculture and Plant Use at Tiwanaku: Social and Political Implications. In *Tiwanaku and Its Hinterland: Archaeology and Paleoecology of an Andean Civilization.*Vol. 2, edited by Alan Kolata, pp. 384–403. Smithsonian Institution Press, Washington, DC

Yoshida, Bonnie
2005 Preliminary Results of Anatomical Analyses of the Burials from Piñami, Bolivia. 2005 Field Season Report. Manuscript on file, Grossmont College, El Cajon, California.

Yoshida, Bonnie and Karen Anderson
2007 Health Effects of the Tiwanaku Expansion: A View from Piñami. Paper presented at the 72nd Annual Meeting of the Society for American Archaeology, Austin Texas.

Appendix 1:

Reports from Beta Analytic Inc.

BETA

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Fax: 305 663 0964
Beta@radiocarbon.com
www.radiocarbon.com

Darden Hood
President

Ronald Hatfield
Christopher Patrick
Deputy Directors

March 26, 2012

Ms. Karen Anderson
5176 Troy Avenue
Fremont, CA 94536
USA

RE: Radiocarbon Dating Results For Samples Q1-A1 Locus 212, Q1-A1 Locus 2010, Q1-A1 Locus 2035, Q1-B Locus 2061, Q1-B Locus 2063

Dear Ms. Anderson:

Enclosed are the radiocarbon dating results for five samples recently sent to us. They each provided plenty of carbon for accurate measurements and all the analyses proceeded normally. The report sheet contains the dating result, method used, material type, applied pretreatment and two-sigma calendar calibration result (where applicable) for each sample.

This report has been both mailed and sent electronically, along with a separate publication quality calendar calibration page. This is useful for incorporating directly into your reports. It is also digitally available in Windows metafile (.wmf) format upon request. Calibrations are calculated using the newest (2004) calibration database. References are quoted on the bottom of each calibration page. Multiple probability ranges may appear in some cases, due to short-term variations in the atmospheric 14C contents at certain time periods. Examining the calibration graphs will help you understand this phenomenon. Calibrations may not be included with all analyses. The upper limit is about 20,000 years, the lower limit is about 250 years and some material types are not suitable for calibration (e.g. water).

We analyzed these samples on a sole priority basis. No students or intern researchers who would necessarily be distracted with other obligations and priorities were used in the analyses. We analyzed them with the combined attention of our entire professional staff.

Information pages are enclosed with the mailed copy of this report. They should answer most of questions you may have. If they do not, or if you have specific questions about the analyses, please do not hesitate to contact us. Someone is always available to answer your questions.

The cost of the analysis was charged to the MASTERCARD card provided. A receipt is enclosed. Thank you. As always, if you have any questions or would like to discuss the results, don't hesitate to contact me.

Sincerely,

Digital signature on file

BETA ANALYTIC INC.
DR. M.A. TAMERS and MR. D.G. HOOD
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305-667-5167 FAX:305-663-0964
beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Ms. Karen Anderson

Report Date: 3/26/2012

Material Received: 3/14/2012

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 318294	820 +/- 30 BP	-11.1 o/oo	1050 +/- 30 BP
SAMPLE : Q1-A1 Locus 212			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT :	(charred material): acid/alkali/acid		
2 SIGMA CALIBRATION :	Cal AD 900 to 920 (Cal BP 1050 to 1030) AND Cal AD 970 to 1020 (Cal BP 980 to 930)		
Beta - 318295	940 +/- 30 BP	-23.6 o/oo	960 +/- 30 BP
SAMPLE : Q1-A1 Locus 2010			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT :	(charred material): acid/alkali/acid		
2 SIGMA CALIBRATION :	Cal AD 1020 to 1160 (Cal BP 930 to 790)		
Beta - 318296	1120 +/- 30 BP	-23.5 o/oo	1140 +/- 30 BP
SAMPLE : Q1-A1 Locus 2035			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT :	(charred material): acid/alkali/acid		
2 SIGMA CALIBRATION :	Cal AD 780 to 790 (Cal BP 1170 to 1160) AND Cal AD 810 to 850 (Cal BP 1140 to 1100) Cal AD 850 to 980 (Cal BP 1100 to 970)		
Beta - 318297	1140 +/- 30 BP	-24.6 o/oo	1150 +/- 30 BP
SAMPLE : Q1-B Locus 2061			
ANALYSIS : AMS-Standard delivery			
MATERIAL/PRETREATMENT :	(charred material): acid/alkali/acid		
2 SIGMA CALIBRATION :	Cal AD 780 to 790 (Cal BP 1170 to 1160) AND Cal AD 800 to 970 (Cal BP 1150 to 980)		

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

BETA ANALYTIC INC.
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beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Ms. Karen Anderson

Report Date: 3/26/2012

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 318299	1210 +/- 30 BP	-24.7 o/oo	1210 +/- 30 BP

SAMPLE : Q1-B Locus 2063
ANALYSIS : AMS-Standard delivery
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid
2 SIGMA CALIBRATION : Cal AD 710 to 750 (Cal BP 1240 to 1200) AND Cal AD 770 to 890 (Cal BP 1180 to 1060)

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.6:lab. mult=1)

Laboratory number: **Beta-318295**

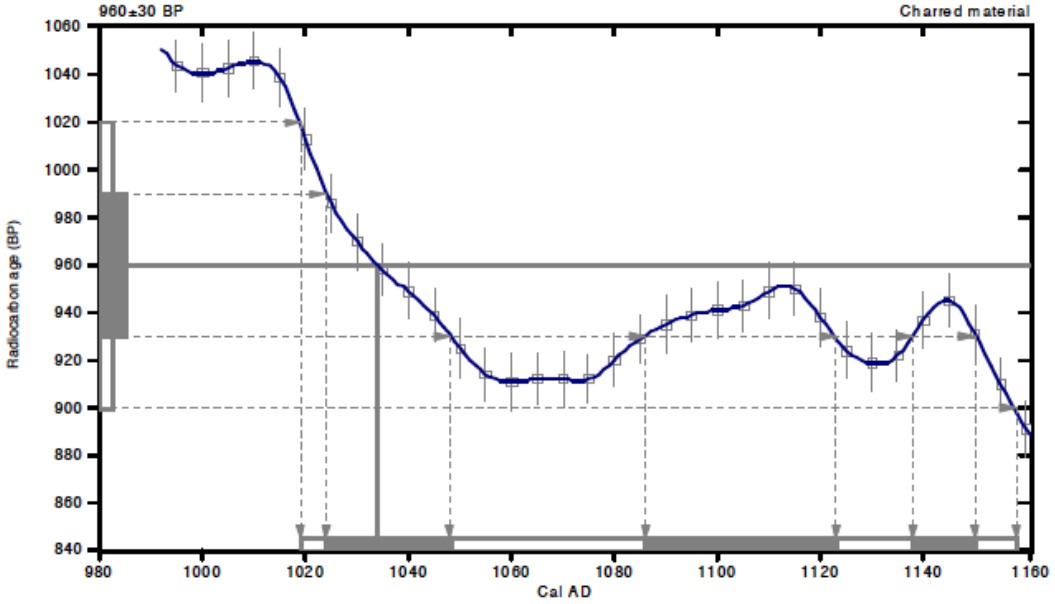
Conventional radiocarbon age: **960±30 BP**

2 Sigma calibrated result: **Cal AD 1020 to 1160 (Cal BP 930 to 790)**
(95% probability)

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1030 (Cal BP 920)

1 Sigma calibrated results: Cal AD 1020 to 1050 (Cal BP 930 to 900) and
(68% probability) Cal AD 1090 to 1120 (Cal BP 860 to 830) and
Cal AD 1140 to 1150 (Cal BP 810 to 800)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.5:lab. mult=1)

Laboratory number: **Beta-318296**

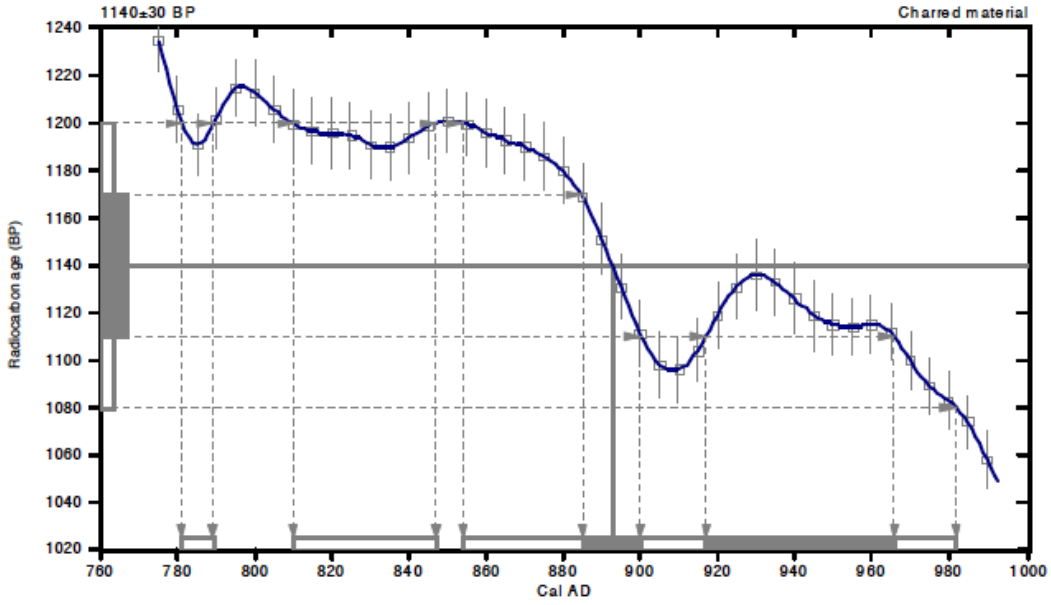
Conventional radiocarbon age: **1140±30 BP**

2 Sigma calibrated results: **Cal AD 780 to 790 (Cal BP 1170 to 1160) and**
(95% probability) **Cal AD 810 to 850 (Cal BP 1140 to 1100) and**
Cal AD 850 to 980 (Cal BP 1100 to 970)

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 890 (Cal BP 1060)

1 Sigma calibrated results: Cal AD 880 to 900 (Cal BP 1060 to 1050) and
(68% probability) Cal AD 920 to 970 (Cal BP 1030 to 980)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.6:lab. mult=1)

Laboratory number: **Beta-318297**

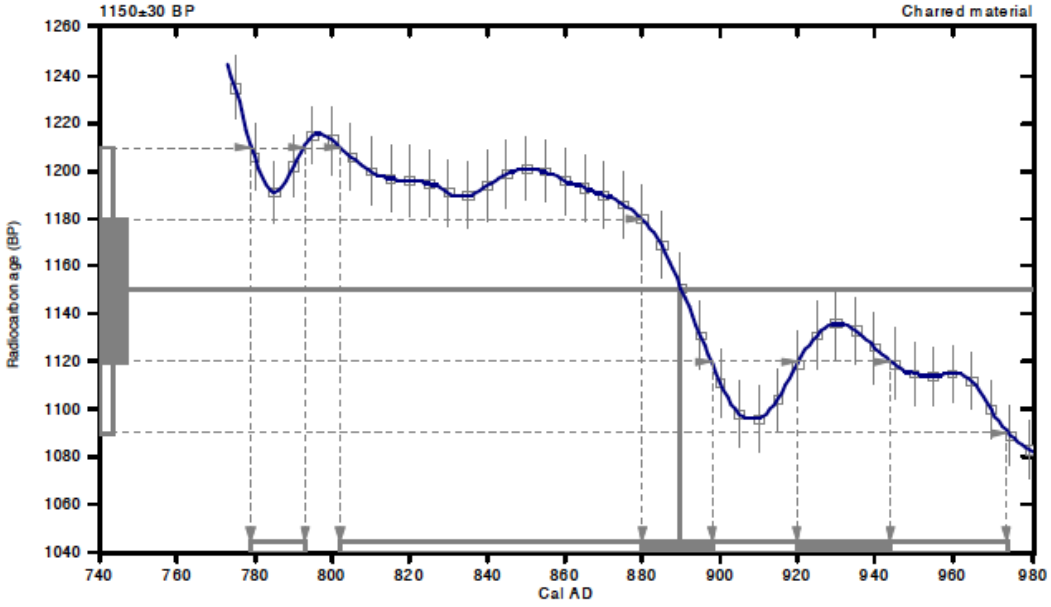
Conventional radiocarbon age: **1150±30 BP**

2 Sigma calibrated results: **Cal AD 780 to 790 (Cal BP 1170 to 1160) and**
(95% probability) **Cal AD 800 to 970 (Cal BP 1150 to 980)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 890 (Cal BP 1060)

1 Sigma calibrated results: Cal AD 880 to 900 (Cal BP 1070 to 1050) and
(68% probability) Cal AD 920 to 940 (Cal BP 1030 to 1010)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.7:lab. mult=1)

Laboratory number: **Beta-318299**

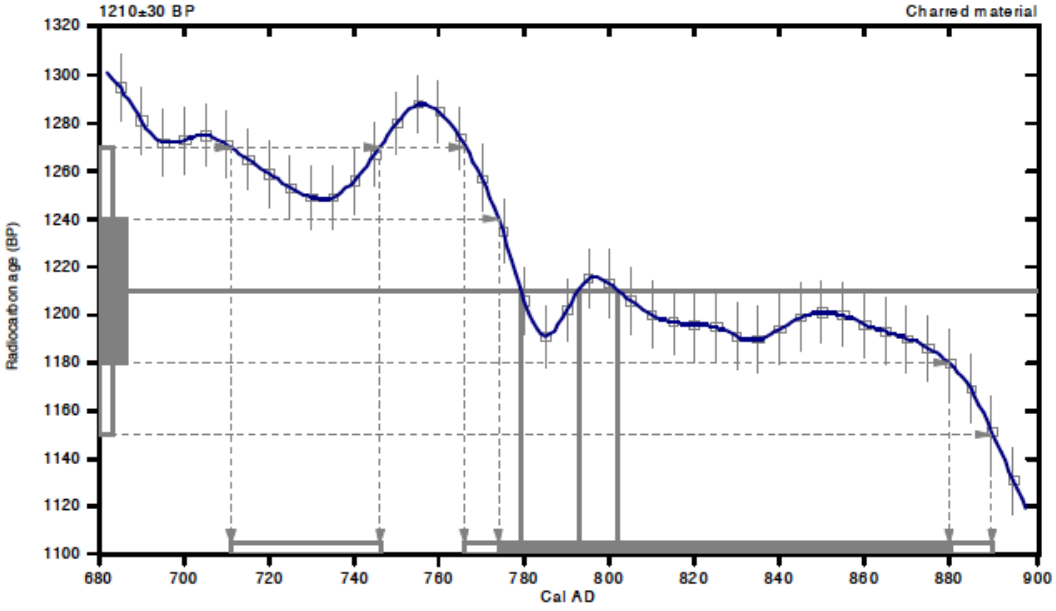
Conventional radiocarbon age: **1210±30 BP**

2 Sigma calibrated results: **Cal AD 710 to 750 (Cal BP 1240 to 1200) and**
(95% probability) **Cal AD 770 to 890 (Cal BP 1180 to 1060)**

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal AD 780 (Cal BP 1170) and
Cal AD 790 (Cal BP 1160) and
Cal AD 800 (Cal BP 1150)

1 Sigma calibrated result: Cal AD 770 to 880 (Cal BP 1180 to 1070)
(68% probability)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

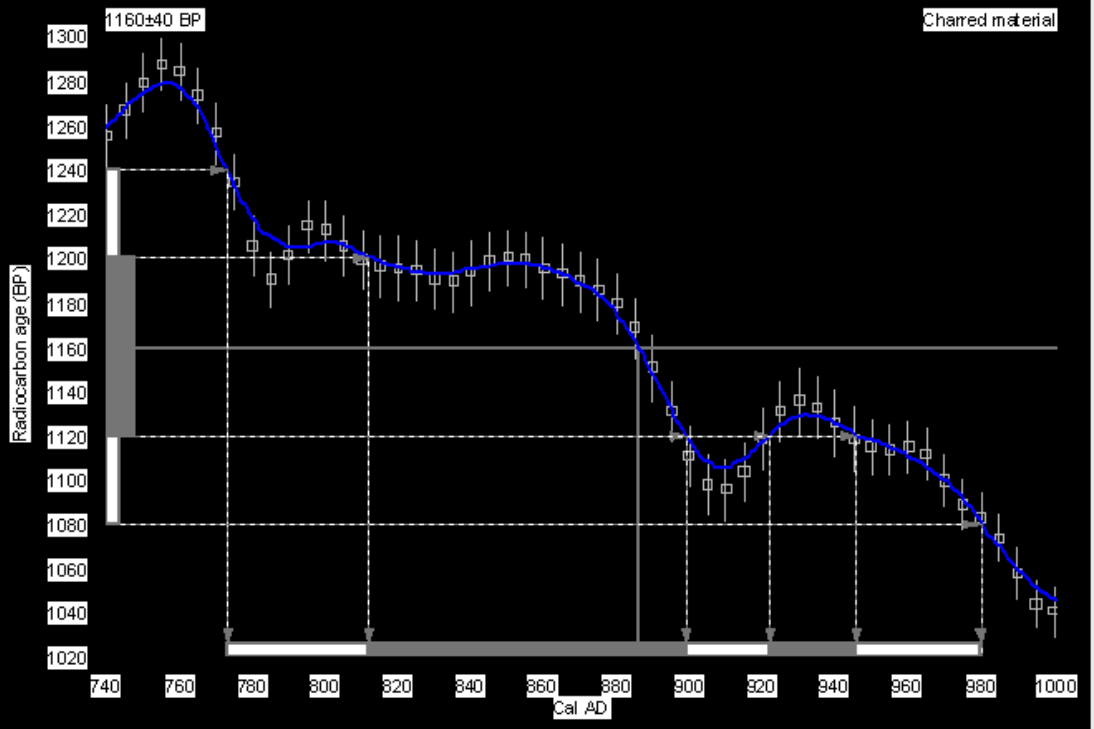
(Variables: est. C13/C12=-25:lab. mult=1)

Laboratory number:	**Beta-068750**
Conventional radiocarbon age[1]:	**1160±40 BP**
2 Sigma calibrated result (95% probability)	**Cal AD 770 to 980 (Cal BP 1180 to 970)**

[1] C13/C12 ratio estimated

Intercept data

Intercept of radiocarbon age with calibration curve:	Cal AD 890 (Cal BP 1060)
1 Sigma calibrated results (68% probability)	Cal AD 810 to 900 (Cal BP 1140 to 1050) and Cal AD 920 to 950 (Cal BP 1030 to 1000)



References:

Database used
IntCal04

Calibration Database
INTCAL04 Radiocarbon Age Calibration
IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

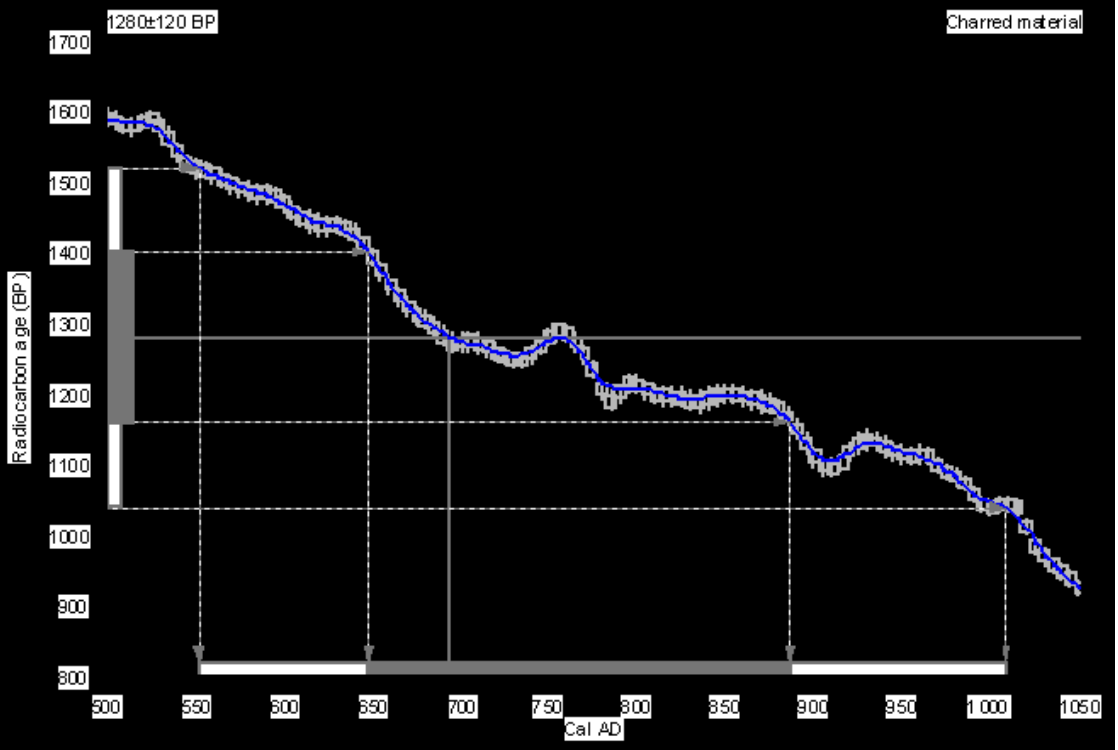
(Variables: est. C13/C12=-25:lab. mult=1)

Laboratory number:	**GX-10760**
Conventional radiocarbon age[1]:	**1280±120 BP**
2 Sigma calibrated result: (95% probability)	**Cal AD 550 to 1010 (Cal BP 1400 to 940)**

[1] *C13/C12 ratio estimated*

Intercept data

Intercept of radiocarbon age with calibration curve:	Cal AD 690 (Cal BP 1260)
1 Sigma calibrated result: (68% probability)	Cal AD 650 to 890 (Cal BP 1300 to 1060)



References:

Database used
INTCAL04

Calibration Database
INTCAL04 Radiocarbon Age Calibration
IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A.S., Vogel, J.C., 1993, Radiocarbon 35(2), p317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

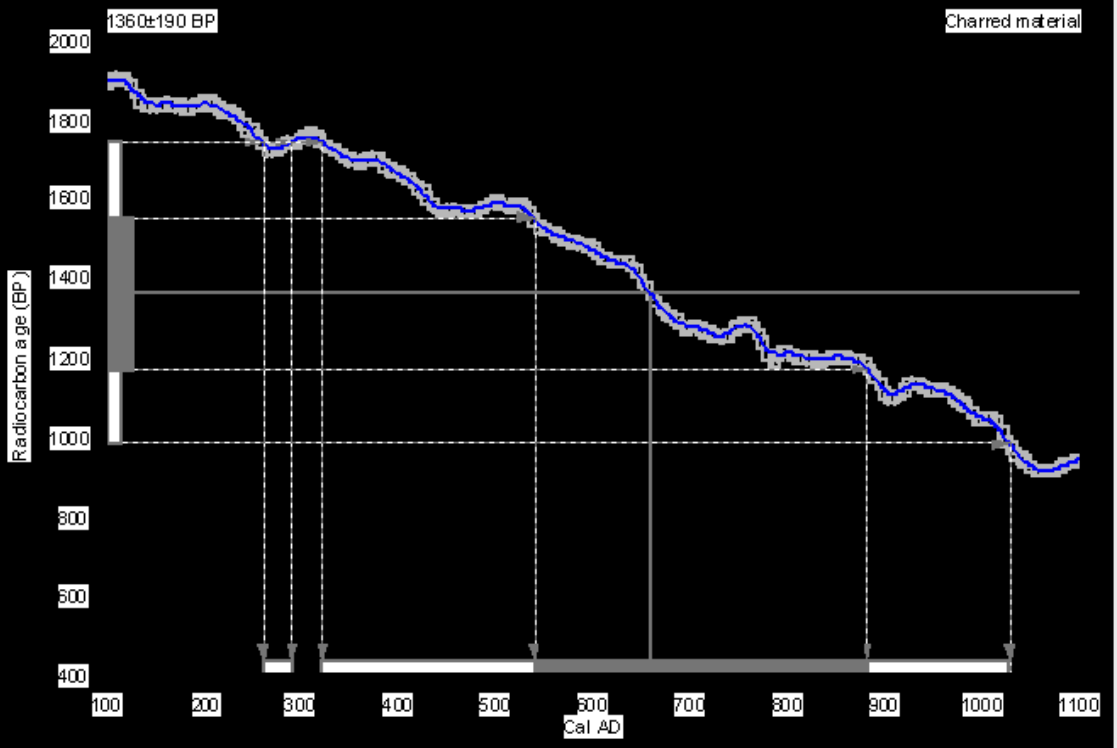
(Variables: est. C13/C12=-25:lab. mult=1)

Laboratory number:	**GX-12136**
Conventional radiocarbon age[1]:	**1360±190 BP**
2 Sigma calibrated results: (95% probability)	**Cal AD 260 to 290 (Cal BP 1690 to 1660) and Cal AD 320 to 1030 (Cal BP 1630 to 920)**

[1] C13/C12 ratio estimated

Intercept data

Intercept of radiocarbon age with calibration curve:	Cal AD 660 (Cal BP 1290)
1 Sigma calibrated result: (68% probability)	Cal AD 540 to 880 (Cal BP 1410 to 1070)



References:

Database used
INTCAL04

Calibration Database
INTCAL04 Radiocarbon Age Calibration
IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

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Appendix 2:

Piñami Burial Data

The following pages record by Funerary Context Number (CF) the details of all funerary contexts, including possible funerary contexts, and offerings.

Three of the contexts were assigned CF numbers (CF-14, CF-23 and CF-57), though they turned out not to be burials. They were either pits or ceramic offerings without bodies.

In the case of two donated skulls, there was no context but CF numbers were assigned.

Burial CF-1a

R-2046 Sector A, PLANE Level 16

Description of the burial and offerings:

Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT.

Context of burial: Body and offerings appeared in Level 16, Sector A. Vertical position of top of the burial chamber unknown. Complete context unknown however it is located within the early burial cluster and likely part of a cemetery area. Early Piñami occupation.

Body position: Seated flexed.

Orientation of body: Facing roughly west – northwest (slumped position makes orientation approximate).

Body Completeness: The body was slumped but apparently complete.

Possible body wrappings: The burial had clear white fibers in a circular pattern under and over the body suggesting body was wrapped. The photos suggest the body may have been wrapped in tree bark under fibrous wrappings.

Burial type: Unknown, possible simple round pit or pit lined with clay blocks.

Burial chamber and method: Unknown, the upper part of the burial chamber was completely destroyed during the PLANE excavation and we have photos and notes only of the base; however, study of the 2002 photos shows this was possibly a shallow pit burial partially made of or lined with yellow clay blocks. Body position suggests the chamber was round. Visible in the north profile are blocks of yellow clay and darker clay mortar. Apparently the burial was filled with dirt after placement.

Offerings: 4 ceramic vessels and 1 or 2 unfired pinch pots. 1 tall CVCT kero, 1 CVCT tazón, 1 CVCT vaso embudo, 1carbon encrusted ollita; 1 (or 2) unfired pinch-pots. The ceramic offerings and pinchpots were placed to the northwest of the body. The vaso embudo was placed inside of one of the keros. Both this kero and the vaso embudo show influence from the Omereque/Caraparial style. These two vessels are similar enough in painting style that they may have been painted by the same person.

From photos of PLANE excavations, one CVCT kero was close to CF-1a but not grouped with the rest—likely associated with 1b.

Notes from Bonnie Yoshida on the skeletal remains: No skeletal remains retained.

Offerings not in photos: Small carbon encrusted *ollita*

1 (possibly 2) small unfired pinch-pots

Body seated flexed facing west, body was slumped forward and flattened; note white fibers and powder under the body

Ollita , lost

Yellow blocks of clay with darker clay "mortar"

Burial CF-1b

R-2013 Sector A, PLANE Level 16

Description of the burial and offerings:

Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT. Limited excavation of cranium and teeth in 2006.

Context of burial: Level 16, Sector A. Complete context unknown however it is located within the early burial cluster and likely part of a cemetery area. Early Piñami occupation.

Body Completeness: Incomplete, disturbed.

Body position: On the side, likely flexed. The lower body was disturbed. Head and jaw were definitely on the side.

Orientation: Hard to tell due to disturbance. The individual was resting on their right side. The position of jaw indicates that the face was toward the south. However, the crania info is unclear. The body could easily have been facing west or southwest.

Possible body wrappings: The 2006 salvage excavation found white vegetable material under and around the bones of the jaw and cranium suggestive of wrapping or mats (see photo).

Burial type: Unknown.

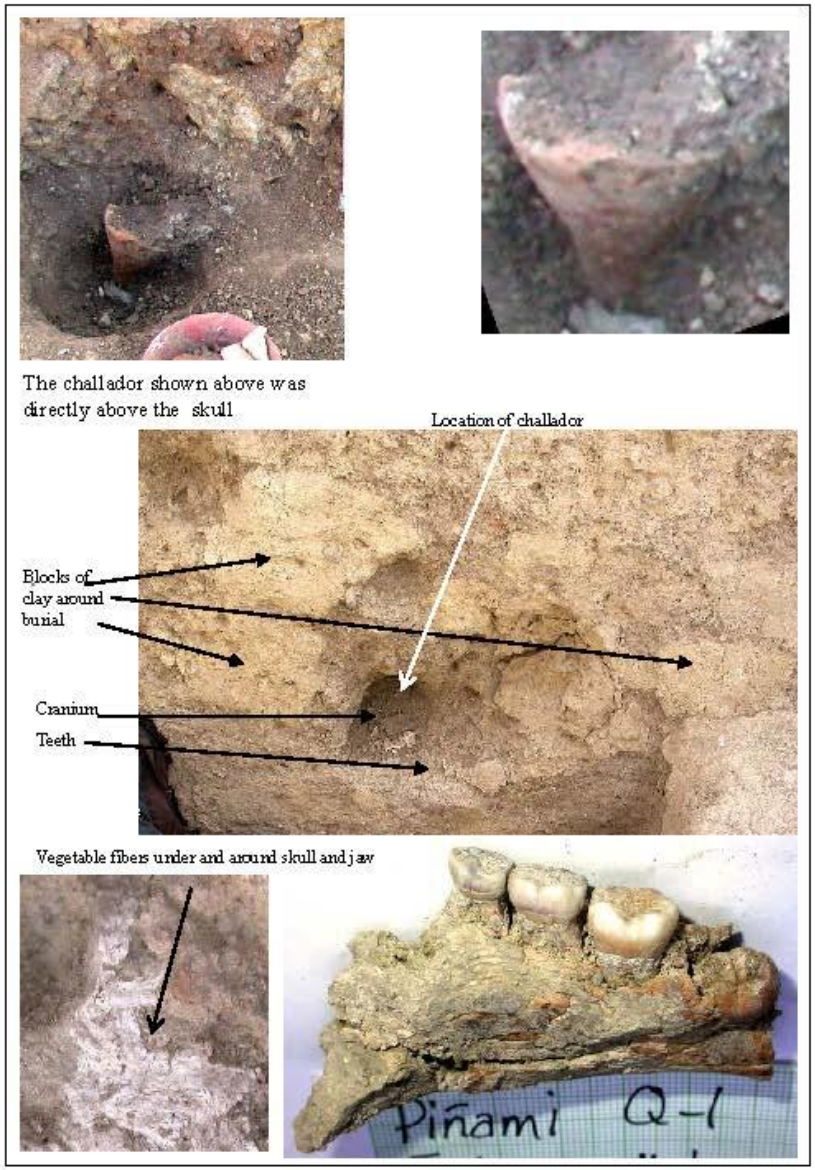
Burial chamber and method: Unknown. No stones visible. There are large blocks of yellow clay visible in the profile surrounding the person. Possible clay chamber or chamber fill using chunks of yellow clay.

Offerings: One challador. The challador was lost but apparently had a broken top before burial. Style is unclear from photos. Whether there were other offerings before disturbance is unknown.

One CVCT kero was close to CF-1a but not grouped with the rest. Due to PLANE excavation methodology we could not tell if this kero was associated with CF-1a or possibly CF-1b.

Notes from Bonnie Yoshida on the skeletal remains:

Possible adolescent burial as cranium was quite thin and not all the molars are out. Remains were not reviewed by BY.



Burial CF-2

R-3001 Sector A, PLANE Level 15/16

Description of the burial and offerings:

Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT.

Context of burial: Top of the burial was at the base of Level 15, Sector A. Complete context unknown however it is located within the early burial cluster and likely part of a cemetery area. Early Piñami occupation.

Body position: Unknown.

Orientation of body: Unknown.

Burial type: Urn burial.

Burial chamber and method: Unknown. The shape of the pit for the urn was not recorded. The urn was interred right side up. The body was placed inside the urn.

Offerings: Tinaja, tazón and unfired pinch pot. The pinch pot was double hole style and was found inside the tinaja with the body. Next to the tinaja directly to the north was a Sauces style tazón placed on its side. The tinaja was a wide-bodied form with nub handles on the shoulder. Cross incisions were inscribed on the nub handles (the tinaja was lost from the collection).

Notes on the skeletal remains:

During the 2002 excavation, teeth were found inside the tinaja. They were quite small and presumed to be from a young child. Age unknown. The teeth were not retained and no additional analysis is possible.

Other offering not in photo: a double hole unfired clay pinch-pot

The tinaja ("urn") shown below was lost. It appears to be similar in form to the one found with CF-65.

Burial CF-3 R-2021 Sector A , PLANE Level 16

Description of the burial and offerings:

Early Piñami burial, preliminary excavation by PLANE. Limited notes and photos by KA and ZT. Additional excavation in 2004 to retrieve skeletal remains.

Context of burial: Rim of burial was Level 16.5, Sector A. Top of the cover stones was about Level 14. Complete context unknown however it is located within the early burial cluster and likely part of a cemetery area. Early Piñami occupation.

Body position: Flexed on the side.

Orientation of body: Body placed on the right side with the head to the north facing 10-20 degrees north of west.

Possible body wrappings: We found white plant fibers and white powder inside the tomb and evidence of burning at the base of the tomb. There were traces that might be bark but the tomb was quite disturbed before the detailed examination in 2004.

Burial type: Rectangular stone tomb.

Burial chamber and method: This tomb had unusual construction techniques in the wall and the cover. The walls had one course of stones at the base, followed by a thick layer of mud followed by another course of stones at the tomb rim (rather than three courses of stone). The cover of the tomb was also unusual as it had a series of smaller stones that extended and balanced over part of the space and were not oriented to the alignment of the tomb. The space between the stone was filled in by smaller stones. (See drawings.)

Orientation of chamber: Tomb oriented ~10-20 degrees east of north, chamber depth from rim stones: ~50 cm. Length 100 by width 70cm.

Offerings: 5 ceramic vessels and one unfired clay vessel. Two were stolen before they could be excavated. The remaining vessels were of varied local styles: Sauces jarrita, Omereque challador, utilitarian ollita (w/o carbon). Possible traces of a basket.

Secondary (post burial) offerings: This burial was interesting for having post burial offerings. The burial had camelid bones (4 feet and lower leg bones and a head) placed on the tomb cover stones. The feet were spaced around the top of the cover stones and the llama head was placed to the southwest of the tomb, also on the cover stones. Also found at the same level as the llama bones was a Sauces style vasija. It is not clear that the Sauces vasija is related to this tomb.

Notes from Bonnie Yoshida on the skeletal remains:
Adult, no age or sex information.

Ceramic Offerings in tomb (5):

One challador (Omereque, Tiwanaku)

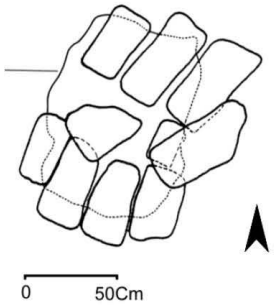
Jarrita (Sauces)

Double handled ollita, w/o carbon

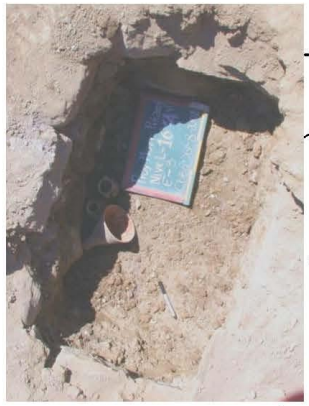
Two vessels were lost before photos were taken—no info as to type or photos

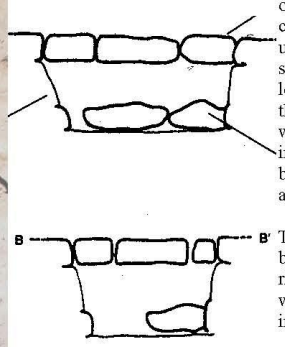
Unfired clay vessel – broken lost

Offerings not in photos: two ceramic vessels and one unfired clay pinch pot.

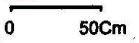


The configuration of the cover stones (above) is based on notes and photos. The configuration was definitely unusual as no large cross stones were used and the longest stones extended so that the majority of their weight was over the tomb interior rather than supported by the rim, a very unstable arrangement.





The tomb facade was formed by a ring of rim stones and a ring of stones along the base with mud fill in the intervening space.



Drawings by Gori Tumi Echevarría.

Burial CF-4

R-3002 Sector A , PLANE Level 15

Description of the burial and offerings:

Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT.

Context of burial: Cover stones appeared at base of Level 15. Complete context unknown but located within the Early Burial Cluster. Early Piñami occupation.

Body position: Unknown.

Orientation of body: Unknown.

Burial type: Stone tomb. Insufficient information to determine the form and orientation of the tomb.

Burial chamber and method: Based on photos and minimal notes, CF-4 is a small tomb with stone cover and internal stone walls. From photos, cover stones were long and laid parallel to each other.

Offerings: Three ceramic offerings: one Sauces/Cochapampa style kero, one Sauces tazón, and one Cochapampa vasija.

Notes on the skeletal remains:

No skeletal remains retained.

Burial CF-5

R-3003 Sector A, PLANE Level 14/15

Description of the burial and offerings:

Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT.

Context of burial: Top of upper olla appeared between Level 14 and 15, Sector A. Complete context unknown however it is located within of the early burial cluster and likely part of a cemetery area. Early Piñami Phase occupation.

Body position: Unknown.

Orientation of body: Unknown

Possible body wrappings: There were white plant fibers and powder found mixed with the bones in the bottom vessel possibly the remains of wrappings.

Burial type: Urn burial (two ollas).

Burial chamber and method: The burial consisted of two ollas. The bottom vessel was missing its rim; it was placed right side up and contained the skeletal remains. The upper vessel (a large, carbon-encrusted cooking olla) had a broken base and was placed upside down with the rim resting inside the bottom vessel. There was an offering vessel and an unfired pinchpot placed within the upper, upside-down olla but both were lost before recording.

The shape of the pit made for the urns is unknown. However, it would need to be deep as the height of the two superimposed ollas was over 100 cm.

Offerings: One small vessel (lost) , small pinchpot (lost) , plus two large ollas serving as burial chamber. Both large ollas showing evidence of carbon on the exterior. The upper vessel was heavily encrusted with carbon. Notably ,the upper olla is clearly non-local as the temper was extremely high quantities of sand and mica characteristic of the highlands (Janusek 2003). The lower olla was lost prior to examination. The small offering vessel placed inside the upper olla and the small pinch pot were lost/stolen prior to preliminary examination and photos.

Notes on the skeletal remains:

No skeletal remains retained for study—original notes in the field state the individual was a child based on teeth.

Lower olla (lost)

Upper olla

No photos available for: small offering vessel and small unfired pinch-pot

Location of CF-5 burial, lower olla shown

Burial CF-6

R3004- Sector A, PLANE Level 17

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Minimal observations by KA. No photos or notes taken prior to destruction.

Context of burial: Level 17, Sector A. Complete context unknown however it is located within of the early burial cluster and likely part of a cemetery area. Illataco-Early Piñami occupation.

Body position: Only the head was excavated, the remainder was destroyed before notes and photos could be taken. The head was placed on its side.

Orientation of body: Head was to the north. However, couldn't see the direction the body was facing.

Burial type: Simple pit, shape unknown.

Burial chamber and method: Likely simple pit, no cover or cap stones present. Only teeth and part of the cranium were observed and possibly two offering vessels. The burial was to have been further excavated for notes and photos but was removed by PLANE workers before this could happen.

Offerings: There were at least two ceramic offerings, both lost. The offerings were placed to the north of the head.

Notes from Bonnie Yoshida on the skeletal remains:

No skeletal remains.

No photos

Burial CF-7

R-3005 Sector A, PLANE Level 16

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT. Minimal notes before destruction of burial.

Context of burial: Level 16, Sector A. Complete context unknown however it is located within of the early burial cluster and likely part of a cemetery area. Illataco-Early Piñami occupation.

Body position: The chamber was quite small, would need to be flexed.

Orientation of body: Unknown

Burial type: Shallow pit with marker stones.

Burial chamber and method: Simple pit with marker stones placed above the burial giving the cross-section of the roof of the pit a triangular shape.

Offerings: We were told by workers that there were no associated offerings.

Notes from Bonnie Yoshida on the skeletal remains:

Human remains were collected including teeth, cranium and a few additional bones; however, unfortunately the bones were lost by PLANE prior to examination. Preliminary notes during excavation indicates that the last molars had not yet erupted—likely adolescent.

No photos available

Burial CF-8

R-2045 Sector A, PLANE Level 17

Description of the burial and offerings:

Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT.

Context of burial: Base of burial chamber was Level 17, Sector A. Height and shape of burial chamber not recorded. Complete context unknown; however, it is located within the early burial cluster and likely part of a cemetery area. Early Piñami occupation.

Body position: On-the-side flexed, right side down.

Orientation of body: Body was oriented with the head to the south and facing east.

Possible body wrappings: White plant fibers found below and over the bones, likely the vestiges of body wrappings.

Burial type: Simple pit, generally oval in shape.

Burial chamber and method: Simple pit burial. The long axis of the oval was oriented slightly to the east of north. The base of the pit was 90 cm long by 50 cm wide.

Offerings: There were four ceramic offering vessels: a local CVCT tall kero, an imported Tiwanaku jarrita, an ollita with carbon on exterior and a tazón (lost) style unknown. The kero was placed to the north at the base of the spine, and the other three vessels were arranged to the south of the head.

Other offerings: Camelid foot bones and some carbon fragments were found over the ribs.

Notes from Bonnie Yoshida on the skeletal remains:

Adult, possible male, no teeth but some cranial vault fragments were present.

Offerings not in photo: Tazón, camelid feet bones, fragments of ceramics

Body on the side flexed, head to the south facing east.

Burial CF-9

R-2042 Sector B, PLANE Level 14

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT.

Context of burial: Level 14, Sector B. Complete context unknown however it is located within the early burial cluster and likely part of a cemetery area. Illataco-Early Piñami occupation.

Body position: Bones clearly disarticulated, as long bones were aligned parallel to each other. Cranium was to the south of the long bones facing north.

Orientation of body: Skull faced north with the top of the head to the west.

Possible body wrappings: There was a circular layer of white powder under the bones with dark red stain along the edges. Carbon and burned lumps of clay were found above the bones, possibly evidencing a small burning event.

Burial type: Secondary burial. Simple round pit.

Burial chamber and method: Round, the pit had lumps of yellow clay around the circumference. The lumps were irregularly spaced so they were most likely to be fill rather than walls. The upper portion of the pit was destroyed before recording.

Offerings: Three ceramic offerings: one imported Tiwanaku blackware kero, a local style tazón (possibly Sauces) and a small local jarrita (likely Sauces).

Also found in 2004 was a small bead embedded in the dirt under the burial. No beads were found in the 2002 excavation but due to the method of excavation they could easily have been missed.

Notes from Bonnie Yoshida on the skeletal remains:

Adult, no sex information.

Imported Tiwanaku kero;

local (Sauces) tazón;

local (Sauces) jarrita

Small bead found under burial, possibly unrelated to the burial

Secondary burial. Long bones aligned parallel north south; cranium placed to the south of the long bones facing north.

Round area under bones showing white powdering remains surrounded by dark red brown stain

Burial CF-10a R-3006 Sector B, PLANE Level ~14

Description of the burial and offerings:

Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT.

Context of burial: Complete context unknown however it is located within the early burial cluster and likely part of a cemetery area. Early Piñami occupation.

Body position: N/A

Orientation of body: N/A

Burial type: Unknown. Round pit, possibly a burial or ceramic offerings, was not completely excavated.

Burial chamber and method: A group of ceramic vessels was excavated with no body immediately found. Later examination in 2004 found that these vessels were found directly over a circular mark in the dirt. The size and texture of this circle is characteristic of other round burials and may be the burial pit.

Offerings: The set of offerings associated with CF-10a are some of the most unusual found at Piñami. It consists of two keros and a tazón and a series of unfired miniature vessels. One of the keros is imported from Tiwanaku, one is a CVCT vessel and the tazón is Sauces.

Inside the tazón were found 7 miniature vessels made of unfired clay including two ollas, one incensario, one challador, one tazón, one tripod tazón and a vasija. The tripod shape is characteristic of the Late Formative local styles but is very rare at Piñami in Middle Horizon contexts. The incensario is a clear model of a Tiwanaku form and is not a local shape.

Notes from Bonnie Yoshida on the skeletal remains:

There were no bones excavated. It is likely the human remains are still in situ.

The small unfired vessels were all found inside the tazón

Area not excavated beneath where the offerings were found. The round outline is very similar in shape and size to those found in round burials.

Burial CF-10b

R-2065 Sector B, PLANE Level ~14

Description of the burial and offerings:

Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT.

Context of burial: Complete context unknown however it is located within of the early burial cluster and likely part of a cemetery area. Early Piñami occupation. It was placed adjacent to CF-10a.

Body position: On the left side flexed.

Orientation of body: North-south with the shoulders to the south and the body facing west.

Body completeness: The head was missing, likely due to the PLANE excavation but could have been missing from the burial originally.

Possible body wrappings: White vegetable fibers were found on the back and shoulders.

Burial type: Burial in simple, irregular oval pit.

Burial chamber and method: Simple irregular pit, 90 cm long and 40 cm wide, no cover or marker stones; the pit was filled in with dirt after placing the body and offerings.

Offerings: 8 ceramic vessels: a kero, a tazón, two challadores that were paired, one inside the other, a pair of jarritas, a mini vessel and a utilitarian ollita. The offerings were placed in front of the body.

The kero looks to be CVCT based on paste. The challador with the star motif (a motif quite similar to those found on Lukurmata tanware, see Bermann 1990) and the tazón are Tiwanaku imports based on mica temper. The small vessel may be a Tiwanaku import as well.

The second challador has Tiwanaku influence and is likely CVCT though it has a post-fire "x" engraved into the exterior side. The two jarritas are a bit odd, less burnished than typical for Tiwanaku or CVCT, with a dotted design that is uncommon in Cochabamba and Tiwanaku and thin uneven red slip. Dots are used in the Sauces iconography so these two vessels may be hybrid styles.

Notes from Bonnie Yoshida on the skeletal remains:

Adult (no age determination possible), probably female.

Not in group photo: ollita with carbon on exterior

Body on the side flexed facing west. Body was aligned roughly north south with the head to the south.

Burial CF-11

R-2049 Sector B, PLANE Level 14

Description of the burial and offerings:

Illataco-Early Piñami burial partially excavated by PLANE. Limited notes and photos by KA and ZT in 2002. Additional detailed excavation of the skeletal remains and tomb in 2004 by Proyecto Piñami.

Context of burial: Level 14, Sector B. Complete context unknown however it is located within the Early cluster of burials and likely was part of a cemetery area. Illataco-Early Piñami occupation.

Body position: Seated flexed.

Orientation of body: facing west/northwest with back to the east. Was found slumped to the right with the head facing down.

Possible body wrappings: A few white vegetable fibers were found close to the bones. There was carbon from maize found above the chest.

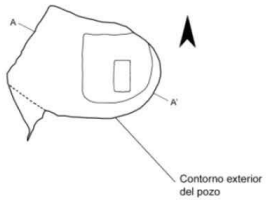
Burial type: Burial in round/oval pit.

Burial chamber and method: The burial was round at the base and almost oval at the rim. It had a vertical wall in cross-section to the east and a sloping area to the west (see drawings). The base was flat and a small base stone was placed under where the body was seated.

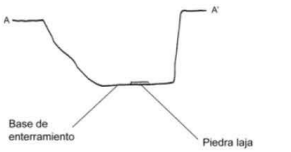
Offerings: An imported Tiwanaku camelid incensario was placed above the body. The incensario is a modeled camelid in blackware showing extremely rare post fire red and orange paint which is partially eroded. The camelid had face painting and a neck ornament—generally showing the same decoration used in two dimensional camelid iconography. The incensario was buried with burned material inside it still intact. Analysis has yet to be made to determine to the type of material that was burned. The carbonized maize was likely a type of offering as well.

Notes from Bonnie Yoshida on the skeletal remains:

Adult male, very robust bones, late middle age (34-45 years), the cranium is clearly deformed with fronto occipital type of cranial deformation. A variety of skeletal pathologies were found. (See Appendix 3 for detail.)



Fronto occipital cranial deformation



0 50Cm

Drawing by Gori Tumi Echevarría

Body seated flexed facing west, body was slumped forward and flattened—a small flat stone was found under the body.

Burial CF-12

R-2038 Sector B, PLANE Level 14

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT. Body and tomb further excavated in 2004.

Context of burial: Level 14, Sector B. Complete context unknown however it is located within the early burial cluster and likely part of a cemetery area. Illataco-Early Piñami occupation.

Body position: Seated flexed.

Orientation of body: The body was slumped toward the eastern wall of the pit but was facing south, southeast.

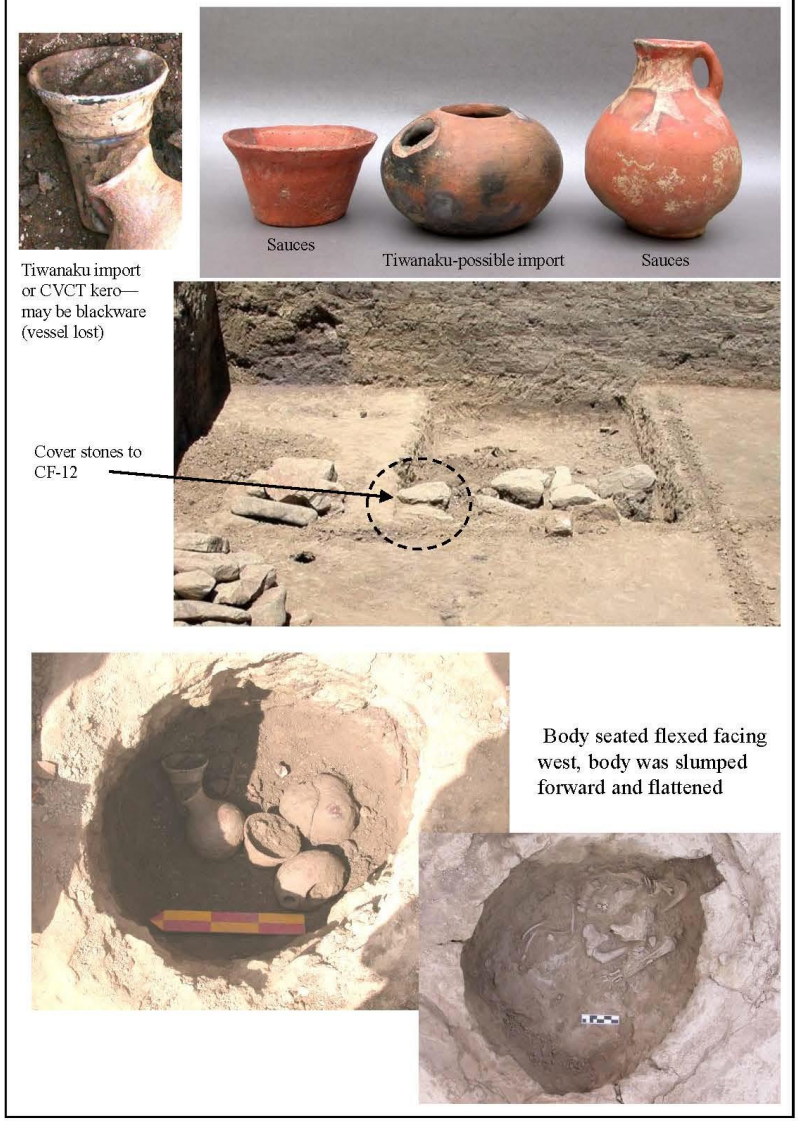
Burial type: burial in a round pit tomb.

Burial chamber and method: A circular pit tomb in plan with a quadrangular cross-section and a flat base. The base is a bit more oval in form than the rim. The pit apparently had three large cover stones. There were no rim stones so the large cover stones were laid on the dirt.

Offerings: 4 ceramic vessels of mixed local and Tiwanaku styles: one Sauces jarra; one Sauces tazón; a Tiwanaku or CVCT kero (vessel was lost and details are not visible in the photos though the kero looks to be Tiwanaku blackware); and a Tiwanaku effigy pot, with broken spout, likely an import from Tiwanaku though the paste is not conclusive. The offerings were found at the level of the cranium and were placed behind the body.

Notes from Bonnie Yoshida on the skeletal remains:

8 years old +/- 24 mos.; skull shows cranial deformation, fronto-occipital type



Burial CF-13

R- 2043 Sector B, PLANE Level 15

Description of the burial and offerings:

Illataco-Early Piñami burial, upper part excavated by PLANE. Very limited notes and photos by KA and ZT. Re-excavated in 2004 by Proyecto Piñami.

Context of burial: Level 15, Sector B. Complete context unknown however it is located within the early burial cluster and likely part of a cemetery area. Illataco-Early Piñami occupation.

Body position: Likely secondary burial. Notes show that the major long bones were parallel and did not appear to be in an articulated position. The femurs were arranged on top with more bones underneath. Teeth were found to the north of the long bones. Rib bones, among others were under the long bones. The dirt here was quite hard and the bones were in an extremely fragile state.

Orientation of body: The long bones were arranged roughly northeast-southwest (15-20 degrees east of north).

Possible body wrappings: White fibers were present below and above the bones excavated in 2004.

Burial type: Likely secondary burial in round pit. Upper section of burial was excavated by PLANE before documentation could be completed but long bones found were parallel and disarticulated.

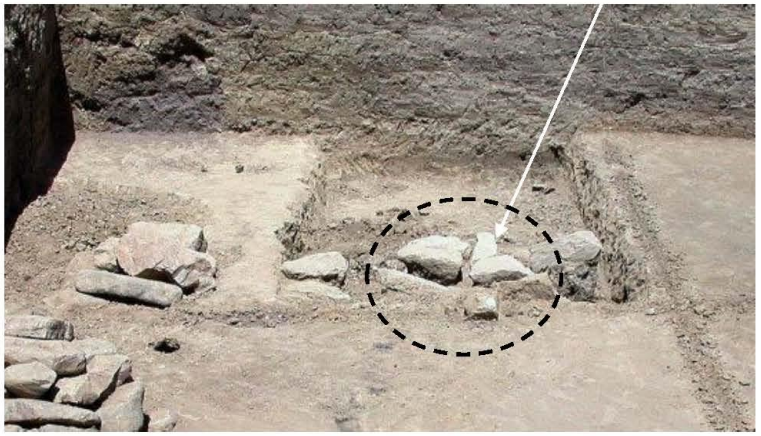
Burial chamber and method: Looks to have been a shallow round pit with a flat base, with a cover of stones. The size of the area of bones in the top layer was only 30 cm by 15 cm though the area of bones expanded in size in the lower layers. At the base we found a red oval brick stain such as was found in CF-39a and b, CF-53 and CF-9 (this burial is most like CF-9).

Offerings: Workers reported one ceramic *kero*, style unknown. No photos, no description, kero is lost.

Notes from Bonnie Yoshida on the skeletal remains:

Adult, no sex or age info, very incomplete and fragmentary.

Disturbed cover stones CF-13



A few human bones remained during re-excavation in 2004

CF-14 (burned area or hearth) Sector B PLANE Level ~15/16

Description:

Identified and partially excavated in 2004. Upper area excavated and not recorded by PLANE in 2002.

Burial type: NOT a burial. It was given a CF number since it had some surface characteristics similar to a few burials. Instead it appears to be a burned area or hearth feature.

Body position: N/A

Orientation of body: N/A

Burial chamber and method: N/A

Context of burial: N/A

Offerings: N/A

Notes on the skeletal remains:

N/A

Burial CF-15

R-3007-A3 Sector A, PLANE Level 18

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT.

Context of burial: Level 18, Sector A. Complete context unknown however it is located within the early burial cluster and likely part of a cemetery area. Illataco-Early Piñami occupation..

Body position: Flexed laying on the left side.

Orientation of body: NNE (axis is 10-20 degrees east of north). The head was to the south and the body was facing WNW.

Possible body wrappings: White fibers were present below and above the bones. There was evidence of burning over the body (carbon and burned clay).

Burial type: Burial in irregular oval pit.

Burial chamber and method: Simple shallow pit with most offerings behind the body to the south and one to the north. No cover stones or other markers. Only dirt fill. The burial pit was 110 cm by 40 cm in width.

Offerings: Five ceramic offerings, one unfired clay vessel (lost). Offerings included one imported Tiwanaku kero based on temper and pigment color. The tazón was CVCT. The utilitarian ollita had carbon on it . The small vasija was undecorated, rough burnished and encrusted with lime deposits. The jarra was lost though based on the minimal iconography visible from photos it appears to be Tiwanaku. One fragmented unfired vessel made of red clay positioned to the north of the body.

Notes from Bonnie Yoshida on the skeletal remains:

Adult female, 25-35 years old (young to middle age).

In addition to the above vessels, the offerings included a jarra and unfired clay vessel shown below

Body on the side flexed, aligned NNE,SSW with the head to the south facing west

Burial CF-16 R-3008 Sector A, PLANE Level 18

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT.

Context of burial: Level 18, Sector A. Complete context unknown however it is located within the early burial cluster and likely part of a cemetery area. Illataco-Early Piñami occupation.

Body position: Flexed, on back, slightly leaning toward the right.

Orientation of body: north-northeast (10-15 degrees east of north) facing up

Possible body wrappings: Significant white vegetable fibers and white powdery material on the bones and offerings both above and below the body.

Burial type: Burial in irregular oval pit.

Burial chamber and method: Shallow oval irregular pit with offerings to the north. No cover stones or other markers. Only dirt fill. The burial pit was 110 cm by 40 cm in width. Under the body there was a section of carbon and under that a layer of white vegetable material. Under that there were a lot of medium size stones. The carbon and white material were part of the burial preparation but it is not clear if the stones were put there on purpose or they were there in the matrix that appeared when the burial pit was prepared. There was dark red clay located to the west of the body at the head and at the hip level. Possibly related to unfired vessels as the red clay was a different color and consistency than burned clay.

Offerings: Five ceramic vessels and possibly two unfired vessels, Ceramic vessels include a kero, challador, tazón, two vasijas (one without handle, one with handle) and a utilitarian ollita with surface carbon. The tazón appears to be CVCT however, the other four decorated vessels are Tiwanaku imports. They each use Tiwanaku orange paint and the challador and vasija with handle have gold mica bits and the vasija without handle also has white bits similar to caliche. This vasija without handle in the only complete vessel at Piñami with fish iconography.

Miniature unfired pinch-pot broken before or during excavation, malachite stone (missing), burned maize, ear of a puma incensario

Notes from Bonnie Yoshida on the skeletal remains: Adult female, middle aged, 35-45. From Lucas strontium analysis, this individual is not from Cochabamba and possibly immigrated from the Cuzco region.

The challador, vasijas and kero are possible Tiwanaku imports

Not shown in photos;
Miniature unfired pinch-pot broken before or during excavation, sodalite stone (missing), burned maize, ear of a puma incensario

Body on the side flexed. aligned north-northeast/south-southwest with the head to the south facing west

Burial CF-17

R-3009-A3 Sector A, PLANE Level 18

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT.

Context of burial: Level 18, Sec A. Complete context unknown however it is located within the early burial cluster and likely part of a cemetery area. Illataco-Early Piñami occupation.

Body position: Two individuals: the lower individual had the head to the north placed on its right side with the vertebra to the east and the face toward the west. The head was to the north. Above this were long bones and pelvis that BY says are from a second individual. The upper individual was too fragmentary to determine body position or orientation.

Orientation of body: Individual A (lower) -- roughly north south; vertebral column was oriented somewhat east of north. Individual B -- unknown.

Possible body wrappings: In addition to the layers of material on the "floor" of the burial, white vegetable fibers and tree bark were found throughout the bones. It is likely that the fibers and wrappings surrounded the body originally. Burned maize was found in the burial though whether this was due to the close proximity of prior hearths or placed on purpose is unknown.

Burial type: Possible double burial or intrusive second burial. Possible secondary burials. Shape unknown from excavation by PLANE, what remained for photos and excavation was a round pedestal.

Burial chamber and method: Pit shape unknown, what was left was 50 cm by 50cm. The body was positioned on an extremely flat prepared floor of clay and white fibers and sheets of tree bark. The body had some stones as a cover or marker but their disposition and relation to the burial chamber itself was not recorded. From photos it looks that the cover stones were immediately on top of the bones and that the chamber was filled with dirt after burial.

Offerings: We were told by PLANE workers that there were a few ceramic offerings that were supposedly already in storage when we arrived, so we have no notes or photos. Whether these vessels were associated with Individual A or B is unknown.

Notes from Bonnie Yoshida on the skeletal remains: Lower individual (A): Adult male (young adult, under 35 years). Upper Individual (B): Adult, age and sex indeterminate (only long bones and a bit of pelvis remained).

No photos of offerings, offerings lost

Cover stones

Cranium and bones were placed on top of a prepared, very flat surface of white powder and remains of tree bark

Long bones aligned parallel north south were from one individual; cranium and vertebra below were from second individual.

View from above.

Burial CF-18

R-2026 Sector A, PLANE Level 19

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT.

Context of burial: Level 19 Sector A. Complete context unknown however it is located within the early burial cluster and likely part of a cemetery area. Illataco-Early Piñami occupation.

Body position: Flexed, lying on the left side.

Orientation of body: Somewhat east of north in axis with the head to the southwest and the head facing to the northwest. Axis of burial approximately 20-30 degrees east of north.

Possible body wrappings: White vegetable fibers were found although not stuck to the bones.

Burial type: Burial in irregular oval pit.

Burial chamber and method: The burial chamber was a simple irregular oval pit. The pit was 82 cm long by 30 cm wide. There was one large long stone placed perpendicular to the body crossing the mid-section of the body. The rock was on top of about 10 cm of compressed dirt such that it is clear that the rock was not placed directly on top of the body or bundle but on top of dirt fill.

Other: The dirt directly underneath the body and offerings was burned earth and chunks of clay 10-15 cm thick in sections, especially toward the upper body. It is likely that the burial pit cut into a preexisting hearth rather than the extensive burning being part of preparing the pit. However, carbonized maize was found above the body and some fragments of utilitarian vessels were in the fill..

Offerings: Four vessels: the base of an imported Tiwanaku saluuerio, a kero (Sauces/Cochapampa style), a jarra (Sauces style) and a small utilitarian vessel. The small utilitarian vessel was lost before photos were taken. It was likely an ollita. The saluuerio was clearly an import from Tiwanaku, the paste is very fine and full of gold mica and uses pigments and iconography not found in the CVCT.

Notes from Bonnie Yoshida on the skeletal remains:

Adult female, 30-40 years of age, various pathologies present (see Appendix 3 for details), pronounced annular cranial deformation.

Missing from photos: small utilitarian vessel

Body on the side flexed. aligned north-northeast/south-southwest with the head to the south facing west

Burned section under the body

Burial CF-19

R-3010 Sector A, PLANE Level 18

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT.

Context of burial: Level 18, Sector A. Complete context unknown however it is located within the early burial cluster and likely part of a cemetery area. Illataco-Early Piñami occupation.

Body position: Difficult to tell, what remained of the body for examination was only a pedestal of 35 cm by 35 cm. What remained was primarily the ribs and vertebrae and some leg long bone fragments.

Orientation of body: Roughly north south (slightly east of north).

Possible body wrappings: At the base of the pit was a layer of white vegetable fibers, and a layer of carbon atop that. Also visible under the bones was a layer of flakey dark vegetable material, likely tree bark. The carbon material may be related to proximity of hearths or it could be the result of purposeful burning related to the burial but there was not enough of the burial remaining to determine. Meanwhile, white fibers were present over and on top of the bones.

Burial type: Shallow pit burial with cover stones.

Burial chamber and method: Looks to be a shallow pit with the stones placed almost directly on top of the bones such that the bones were somewhat compacted by the weight. The base of the burial pit was extremely flat (similar to CF-17) with a prepared clay or mud base.

Offerings: Unknown. PLANE workers reported that there were ceramic vessels associated. No information on how many or what type.

Notes from Bonnie Yoshida on the skeletal remains:

Adult, no sex or age info. Bones present for analysis were thoracic vertebrae and some leg bone fragments.

Burial CF-20a

R-3011 Sector A , North Exterior

Description of the burial and offerings:

Late Piñami burial excavated by PLANE. Limited photos by KA.

Context of burial: Found in passage way about midway in the mound (at least a meter below the surface and 2 meters above the base). Complete context unknown however in horizontal space it is located close to the Late Piñami burial cluster and was possibly part of a cemetery area. Late Piñami occupation.

Body position: Placed on the right side, flexed.

Orientation of body: North/northeast – south/southwest with the head to the north facing WNW.

Possible body wrappings: White vegetable fibers were present .

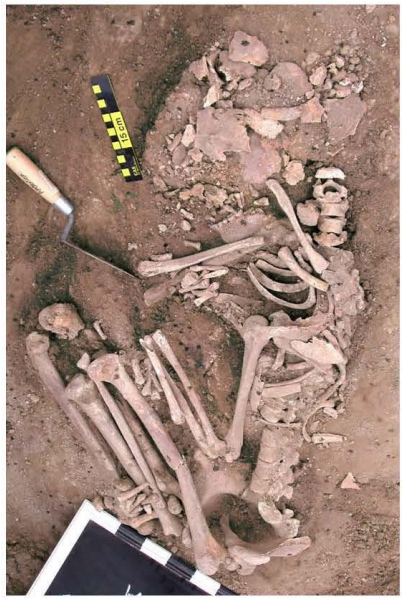
Burial type: Burial in apparently irregular pit with no cover stones.

Burial chamber and method: Simple pit excavated in the earth, the shape is unclear but looks to be oval.

Offerings: Three ceramic vessels. A small utilitarian single handle vasija, a CVCT tazón and a small carbon encrusted double handle ollita. The ollita was interesting for having modeling on both sides with different forms on each side.

Notes on the skeletal remains:

No skeletal remains available for study, apparently lost.



Body on the side flexed. Body was aligned north south with the head to the north facing west.

Burial CF-20b no context info

Description of the offerings:

Probably Late Piñami. Vessels were found in a separate bag within a larger bag also containing the vessels from CF-20A. Likely a gravelot but we did not see these vessels excavated nor receive any information about them.

Context of burial: Unknown if these are vessels from a single gravelot as there are no photos or notes about the context and KA and ZT did not see them being excavated. However, these vessels are one set of three sets of vessels that were packed separately but were included in the larger bag containing the 20A gravelot and it is highly likely that these undocumented bags of vessels represent single contexts, likely offerings from burials that we did not see excavated. I have separated these vessels into contexts 20B, C and D since they were placed in the larger bag including 20A, a documented burial. Whether these vessels are from a similar chronological context to 20A (i.e. late Piñami) is unknown but likely.

Body position: Unknown

Orientation of body: Unknown

Burial type: Unknown

Burial chamber and method: Unknown

Offerings: One small kero and a tazón both CVCT style with no evidence of being imported. The kero is smaller than normal but finely manufactured: highly burnished with delicate use of vertical lines with alternating white, orange and black stripes.

Notes on the skeletal remains:

No skeletal remains are available for study.

Burial CF-20c no context info

Description of the vessels:

Probably Late Piñami. Vessels were found a bag separately within a larger bag also containing the vessels from CF-20A. Likely a gravelot but we did not see these vessels excavated nor receive any information about them.

Context of burial: Unknown if these are vessels from a single gravelot as there are no photos or notes about the context and KA and ZT did not see them being excavated. However, these vessels are one set of three sets of vessels that packed separately but were included in the larger bag containing the 20A gravelot and it is highly likely that these undocumented bags of vessels represent single contexts, likely burials that we did not see excavated. I have separated these vessels into contexts 20B, C and D since they were placed in the larger bag including 20A, a documented burial. Whether these vessels are from a similar chronological context to 20A (i.e., Late Piñami) is unknown but likely.

Body position: Unknown

Orientation of body: Unknown

Burial type: Unknown

Burial chamber and method: Unknown

Offerings: Two ceramic offerings: one CVCT tazón and a utilitarian ollita with carbon. In addition, three unfired clay pieces made out of yellow clay. Two are very rustic single hole pinch-pots and the other is a flattened slab of clay.

Notes on the skeletal remains:

No skeletal remains available for study.

Burial CF-20d no context info

Description of the burial and offerings:

Probably Late Piñami. Vessels were found a separate bag within a larger bag also containing the vessels from CF-20A. Likely a gravelot but we did not see these vessels excavated nor receive any information about them.

Context of burial: Unknown if this vessel comprises a single gravelot as there are no photos or notes about the context and KA and ZT did not see them being excavated. However, the vessel was found in its own bag within a larger bag also containing the known gravelot vessels for 20A so it is likely this vessel is from a single context. The completeness of the vessel suggests a burial context. Whether this vessel is from a similar chronological context as 20A (i.e., late Piñami) is unknown but likely.

Body position: Unknown

Orientation of body: Unknown

Burial type: Unknown

Burial chamber and method: Unknown

Offerings: One CVCT tazón.

Notes on the skeletal remains:

No skeletal remains available for study.

Burial CF-21

R-2010 Sector A, PLANE Level 19-20

Description of the burial and offerings:

Illataco-Early Piñami burial completely excavated by Proyecto Piñami in 2003. Upper part of context (first appearance of the tomb) excavated by PLANE.

Context of burial: PLANE Level 19-20, Sector A. This burial was close to the early burial cluster and may be part of a cemetery area. Illataco/Early Piñami phase.

Body position: Seated flexed.

Orientation of body: The person was facing south-southwest with back to the north/northeast.

Possible body wrappings: Some white material found below the body.

Burial type: Burial in round tomb.

Burial chamber and method: Very regular round pit, 75 cm in diameter, with straight sides approximately 50 cm deep. After placing the body and offerings, the burial was filled in with lumps of clay and dirt fill. Above this fill was a compact layer of dense clay ~15 cm thick.

Offerings: Ceramics and camelid feet and head. There were two ceramic vessels, a CVCT style kero and CVCT tazón. The ceramic offerings were placed in front of the body. Also, there was a camelid head to the right side of the body and four camelid feet arranged at intervals around the body.

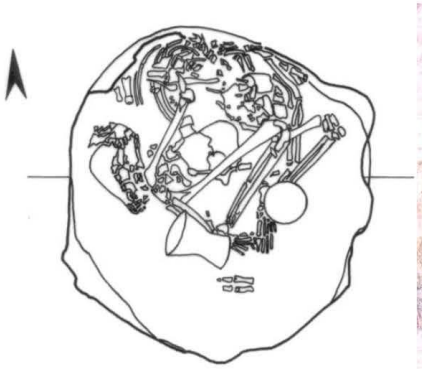
Notes from Bonnie Yoshida on the skeletal remains:

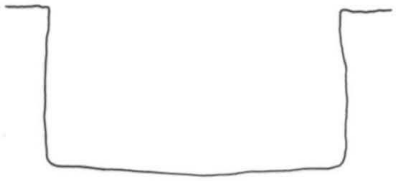
Adolescent 14-18 years of age, probable female.

Health indicators show anemia *cribra orbitalia* (only one of all burials showing anemia), and periosteal remodeling visible on the visceral surfaces of several ribs. See Appendix 3 for detail.

Offerings not in photo: Camelid cranium and four camelid feet

Tomb prior to excavation showing seal of dense clay placed above fill over body





Body seated flexed facing south-southwest, body was slumped forward and flattened

Drawing by Gori Tumi Echevarría

0 10 20 30 cm

Burial CF-22 R- 1142 Sector A1

Description of the burial and offerings:

Late Piñami burial. The majority of the burial was destroyed by PLANE during the 2002 excavation of Sector A. The minimal teeth and bones that remained were excavated in 2003 by Proyecto Piñami.

Context of burial: Chronologically, Late Piñami Phase. The remains indicate a burial of a infant/child in a household context..

Body position: Unknown

Orientation of body: Unknown

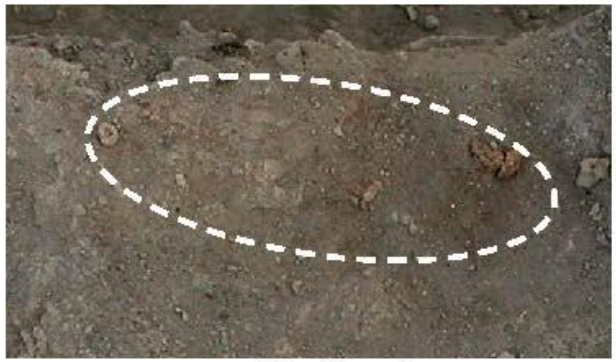
Burial type: Unknown. Burial evidence limited to human teeth and some powdery cranium fragments found in a hearth and ash pit area. The teeth were found close to the western edge of sector A-1 so that if there had originally been an additional part to this burial, it was destroyed by PLANE in their excavation of Sector A.

Burial chamber and method: Appears to be a very shallow pit or depression – possibly the infant/child was buried in a hearth as the fragmentary bones were mixed in with ashes. The ash pit itself is small (less than 50 cm in diameter), round and irregular. Dirt and other materials were placed directly over the body. Very informal burial.

Offerings: None found.

Notes on the skeletal remains:

Not analyzed but notes suggest an infant based on the teeth



Tooth and bone remains

Base of ash area

CF-23 R-1002-A1

Description of the burial and offerings:

Area completely excavated by Proyecto Piñami in 2003

Burial type: Not a burial. The feature consisted of an upside-down utilitarian vessel. This was given a CF number since it was considered to likely be an offering for a burial beneath it. However, only the vessel was in the context and it appears it was a sub-floor offering of some kind.

Body position: N/A

Orientation of body: N/A

Burial chamber and method: N/A

Shape of burial: N/A

Context of burial: Late Piñami, domestic area.

Other: N/A

Offerings: One small/med undecorated olla.

Notes on the skeletal remains:

No skeletal remains.

Burial CF-24a R-189a Sector C-1

Description of the burial and offerings:

Early Piñami burial completely excavated by Proyecto Piñami in 2003.

Context of Burial: Hard to say since the burial chamber for CF-24a was found at the base of an oval pit. CF-24a began in the west end of this oval pit where we found a circular area with looser dirt. If this burial is associated with the oval pit, the context is in a residential area within a room. However, as it is more likely the oval pit was subsequent and CF-24a was in place substantially earlier. At the mouth of the CF-24a was placed a camelid jaw and leg bone. The temporal relation of the camelid offerings is also not secure as they could have been placed at the top of the original burial or as later offerings upon opening the oval pit.

Assuming the burial was made at the level of rim of the burial, this would be an Early Piñami Phase burial.

Body position: Flexed, lying on the right side.

Orientation of body: The axis of the body was NE-SW with the head located to the southwest facing the southeast.

Burial type: Irregular pit, round at the top, oval at the base.

Burial chamber and method: A simple oval pit in plan and circular, concave in cross-section. The body was placed in the pit and dirt was used to fill in the chamber. The height of the hole and chamber from the llama bones to the base was a bit over 1 meter. Interior chamber was oval, 70cm by 46 cm.

Offerings: One ceramic offering. A Tiwanak/CVCT style kero with a broken top that had been filed down for continued use after breakage. The bottom had an incised "x" in it and the paste was redder than typical so potentially imported rather than CVCT. A camelid jaw and long leg bone were found on the fill at the top of the burial pit.

Notes from Bonnie Yoshida on the skeletal remains:

Adult, about 30 years old, possible female.


Possible Tiwanaku import


X etched into the base of the kero


Camelid offerings placed at the base of the oval pit over the beginning of the CF-24A chamber

View of oval pit and entrance to the pit of CF24a

Burial CF-24b R-189b Sector C-1

Description of the burial and offerings:

Illataco-Early Piñami burial completely excavated by Proyecto Piñami in 2003.

Context of burial: The burial was found at the base of CF-24a. Originally we thought that this was part of the CF-24a context however, it is clear that is was a separate and pre-existing burial. It was quite deep down in the mound. Illataco/Early Piñami phase.

Body position: The body was fragmentary and the majority of the bones were powder. Only the cranium was semi intact. The position of the cranium suggests a seated position (i.e., the body was not on its side.)

Orientation of body: Facing west.

Burial type: Burial in round irregular pit.

Burial chamber and method: Round irregular pit in plan and quite irregular in cross-section. The depth of this pit was 45cm and it is likely that CF-24a cut into the upper portion of the pit. After placing the body and the offerings, the chamber was filled in with dirt. CF-24b was sealed at the upper surface (the base of 24a). It is possible that this was added by the people who made the chamber for 24a to make the base of that chamber firm rather than a seal associated with 24b but we cannot tell for certain. The excavation of this burial was difficult due to its depth in the mound.

Offerings: Two ceramic offerings placed above and in front of the body. One offering was a round belly Cochapampa/Sauces jarra and second was narrower jarra of unknown style. This second jarra had basketry impression marks on the base and was sealed with clay prior to burial. This proved to be the only vessel with intact food remains found at Piñami. The remains inside of the vessel were remarkable as they contained bones of rodents (possibly cuy), fish bones and a portion of a large bone that is likely from camelid. These were all mixed together and the animal bones were not complete (possibly a meaty stew). There was also a small unworked stone in the dirt fill about 10 by 12 by 4 cm found next to the offering vessels. It is not known if this was just part of the fill or placed on purpose.

Notes from Bonnie Yoshida on the skeletal remains:

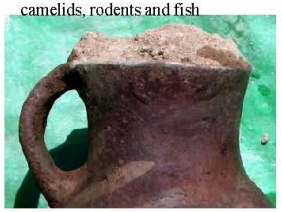
Neonate, birth +/- 2 months

Two jarras as offerings. One on left is Cochapampa style. The style of the on the right is unknown.

Possible offering, irregular unworked stone.

Basketry impression on base of jarra above right

Seal of clay on top of jarra. Inside the vessel were found the bones of camelids, rodents and fish



Burial CF-25

R-195 Sector C-1

Description of the burial and offerings:

Late Piñami burial, excavation by Proyecto Piñami in 2003.

Context of burial: Burial located within a residential area, under a room. Late Piñami Phase.

Body position: Face down, legs flexed, arms straight. This is the only burial of its type excavated at Piñami. The body was on its face, and the head, vertebral column and legs form a zigzag. The legs were just bent back at the knees (not flexed) and the arms were extended. Very casual and atypical body position.

Orientation of body: Slightly north of west. The head is to the west facing down. This burial is the only one that is situated perpendicular to the normal orientation of slightly east of north.

Possible body wrappings: There is a tiny bit of white fiber under the mandible bone but none on the bones. There is no clear evidence of wrapping.

Burial type: Burial in oval pit.

Burial chamber and method: The burial was in a formally excavated oval pit with straight sided walls. The pit was filled with loose dirt and subsequently sealed with clay. The area above this burial was leveled off with fill and a clay floor placed on the fill obscuring the pit. The pit was 90 cm long by 50 cm wide with a depth of approximately 50cm.

Offerings: No ceramic offerings. A broken camelid mandible found to the left of the head was possibly associated with the burial. About 5cm below the level of the body was a lithic (see photo). It is not clear this was associated.

Notes from Bonnie Yoshida on the skeletal remains:

Child, age 10 years (+/- 30 months). Despite the odd position, there was no evidence of a violent death. Possible cranial deformation.

Body was placed face down. Knees were bent up behind the body but arms were not flexed. Unique body position at Piñami.

To the left of the head is a portion of a camelid mandible.

CF-24A

Beginning of CF-25

Base of CF-25 after excavation showing placement of lithic

Burial CF-26

R-197-C, Sector C-1

Description of the burial and offerings:

Late Piñami burial, excavation by Proyecto Piñami in 2003.

Context of burial: Unknown. This burial was encountered when excavating CF-25 at base of the pit on the eastern side. Thus, it was found under where we had excavated. Context is early in the Late Piñami phase.

Body position: The skeletal materials were completely deteriorated so that the position and orientation of the body could not be determined. The cranium was found to the east of the pit.

Orientation of body: Unable to determine; extremely poor preservation.

Possible body wrappings: Significant presence of white vegetable fibers, white powder and a covering material that possibly was bark around the body. The remains of plant material clearly made a circular pattern and the powdered human remains were inside the circle. The body was likely wrapped in a bundle.

Burial type: Burial in round pit.

Burial chamber and method: Pit circular in plane view and semi-circular in cross-section with a flat base. Measurements of base were 60cm by 45 cm. Apparently the tomb was sealed but the body was not covered with dirt as there was a significant open space above the body.

Offerings: None

Notes from Bonnie Yoshida on the skeletal remains:

Child 5yrs +/- 16 months

Opening of CF-26 found at the base of and below CF-25.

Base of CF26 showing human bones, round area with white fibers, white powder, some brown material that looks like tree bark, and a couple of carbon chunks

Burial CF-27

R-198 Sec C-1 (page 1 of 2)

Description of the burial and offerings:

Early Piñami burial excavated by Proyecto Piñami in 2003.

General: CF-27 was the only tomb found that clearly contained two individuals (rather than a second intrusive burial). They were placed one on top of the other. Individual A (the upper person) was potentially placed at some point after Individual B since the bones of individual A were on top of some of the offerings that were placed in the center of the tomb likely on top of Individual B's bundle.

Context of burial: Unknown. This tomb was found at the base of CF-26, about a meter below the excavated surface and over two meters down from the surface of the mound fully outside of the western limits of Unit C. Temporally it is Early Piñami Phase.

Body position: Unknown, both bodies were in a terrible state of preservation. The teeth of Individual A were located to the north and the teeth of Individual B were to the south suggesting their heads were placed opposite each other. From the shape of the tomb, it is likely that they were both flexed on the side rather than seated flexed.

Orientation of body: Body orientation unknown but the orientation of the tomb chamber was north south.

Burial type: Deposition in a rectangular tomb.

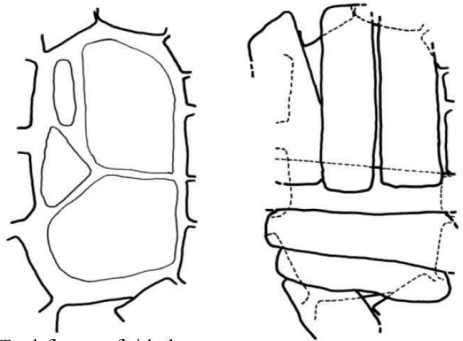
Burial chamber and method: Rectangular stone tomb including stone walls, cover and floor. Plan form was rectangular and section was semi-trapezoidal as the interior walls had a slight inward inclination especially at the rim. The walls were lumpy and in places had a surface treatment of mud mixed with fibers. All the walls including the two short walls had an irregular layout of stones, using a mixture of stones and mud fill in the construction. The tomb had an extremely well made floor of flat slabs. The tomb roof was formed by a series of long stones that crossed the tomb widthwise to the south and length wise to the north with smaller stones used to fill in gaps.

Notes from Bonnie Yoshida on the skeletal remains:

Individual A: Adult, no sex information

Individual B: Juvenile, 15 years old +/- 36 months (range: 12 to 18), no sex information.

Vessels in oval were found below Individual A and were more clearly associated with B. The other vessels could be associated with either A or B.



Tomb floor was finished with flat stones

Roof stones of tomb

The tomb was found at the base of CF-26. The entirety of the tomb was not accessible so we do not have a full outline of all the tomb stones

Drawing by Gori Tumi Echevarría

0 50Cm

Interior structure of tomb—view shows end wall, approx 50 cm wide. Note the use of mud fill and the irregular layout of stones.

Burial CF-27

R-198 Sec C-1 (page 2 of 2)

Offerings: 12 ceramic vessels, 110 green and red stone beads, at least one basket, and probably at least two unfired clay vessels (two concentrations of bright red clay bits were found in clumps near the other offering vessels at the base of the tomb).

Basket and plant remains: While the preservation of the bones was very poor, CF-27 produced some of the best preserved plant materials. The remains from the base of a finely woven basket remain intact on the interior rim of an imported Tiwanaku kero. This is best preserved example of a basket at Piñami. The same Tiwanaku kero has the remains of maize leaf wrapped around it. We have extensive grass fibers present on the offerings and on the bones. They do not appear to be woven and instead appear to be a type of packing material for the human remains and ceramic vessels.

Vessel detail: Imported Tiwanaku large kero, imported Tiwanaku medium kero, two pairs of Cochapampa or CVCT challadores, one Cochapampa style tazón , three local Cochapampa or CVCT style vasijas, one crenulated broken utilitarian vasija, one hollow base undecorated libation bowl with local paste.

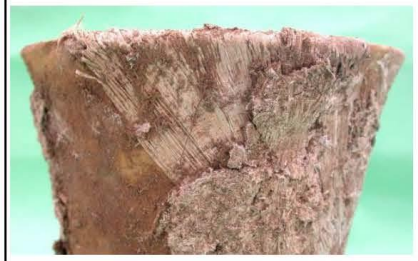
The two pairs of challadores from this tomb are interesting. The main iconography is identical among the four and the only difference is the interior rim bands: two had wavy bands and two had straight rim bands. The challadores were placed in pairs each with one wavy band vessel and one straight band vessel (i.e., they were not placed with their exact pair).

The HBLB had burned material still intact in the vessel. The burned material has not yet been analyzed but visibly contained both plants and camelid dung.

It is possible that all of these items were associated with Individual B or that a portion of them were associated with Individual B and a portion with Individual A. The 4 challadores , the hollow base libation bowl and the two concentrations of red clay were found under Individual A located to the north of the tomb and thus are more securely associated with Individual B. The other 7 offerings were more toward the surface along the south edge of the tomb and potentially could be associated with Individual A. However, it is worth noting that the 12 vessels are similar to the ceramics found with CF-36 which also had 12 vessels including 4 matching drinking cups.

Beads: The beads have not been analyzed but were a variety of colors of green or red. The green stone is likely malachite. Due to the extremely poor bone preservation, it is impossible to say which individual was associated with the beads. However, the beads were found together to the south of the tomb and if they were part of a necklace, they would be associated with lower individual B.

Close up fill of grasses apparently used as general fill to the tomb



The larger kero was wrapped in maize leaves and than placed in burial with grass fill

Burned material present at the base of the libation bowl – not analyzed.

One of the pairs of challadores. The interior one had straight line interior rim band and the exterior had wavy line bands

Remains of basket base on interior of the larger kero, also visible are remains of maize leave wrappings

110 stone beads. Stone beads were not common offerings, they were only found in two burials. Most likely associated with lower Individual B.
Note: the beads were not on a string when found.

Burial CF-28 R-1170 Sector A1

Description of the burial and offerings:

Late Piñami burial completely excavated by Proyecto Piñami in 2003. Context info complete.

Context of burial: Late Piñami occupation. Burial was found in a cluster of tombs. However, the tombs in this area cut into habitation floors so it is clear that prior to converting to a cemetery zone, the area had been domestic.

Body position: Flexed, lying on the right side.

Orientation of body: Slightly east of north with the head to the north, facing east/northeast. The orientation of the tomb in general was 15-20 degrees east of north.

Possible body wrappings: White vegetable fibers and white powdery material were present in small amounts. White material was especially visible at the base of the body as imprints found in the clay floor of the tomb.

Burial type: Burial in a rectangular tomb.

Burial chamber and method: Tomb with a rectangular plan and quadrangular cross-section. The interior tomb space was 85cm by 55 cm. The tomb was constructed in two clear phases, first, the excavation of a rectangular pit with rounded corners approx. 140 cm by 160 cm and, second, construction of interior walls within the pit to form the tomb. The excavation and construction of the tomb was highly formal in the finishing details including covering of the interior walls with mud and a prepared clay floor that was 2-4 centimeters thick. Fill was placed between the outer pit and the inner walls. The fill that covered the body was composed of large irregular chunks of clay which formed a type of tomb cover. A final covering of mud and irregular blocks of clay covered the entire area above the tomb walls. Above that level the tomb was sealed with a layer of smoothed clay.

Offerings: Three ceramic vessels – one CVCT kero, a CVCT tazón and a utilitarian ollita with carbon – and remains of a mat or basket (on the base of the tazón) .

Notes from Bonnie Yoshida on the skeletal remains:

Adolescent, 15-20 years old, possible male.

The tomb a rectangular structure made of blocks of clay set within a rectangular pit

View from above, showing outer rectangular pit and clay walled construction within it.

Tazón had remains of what appears to be a basket or woven mat

Drawing by Gori Tumi Echevarría

Burial CF-29 R-1180 Sector A1

Description of the burial and offerings:

Late Piñami burial completely excavated by Proyecto Piñami in 2003. Context info complete.

Context of burial: Late Piñami occupation. The general context was residential, close to floors, walls and hearths. However, the burial was found in a cluster of burials. The cluster was cut into the residential space so this burial may have been placed in an area that had been abandoned and transitioned to a cemetery context. The pit of CF-29 cut into the upper portions of the tomb of CF-30 (see drawing in Appendix 2, CF-30).

Body position: CF-29 was flexed, lying on the left side. CF-30, a young juvenile ~6 mos., was placed about 15 cm above and in front of CF-29. It was not clearly associated with CF-29 but it is possible (see drawing in CF30).

Orientation of body: East of north, head to the north, facing east/southeast.

Other: Evidence of sheets of tree bark under the body principally associated with the bones. Evidence of burning below some bones (e.g. left arm and others).

Burial type: Burial in simple oval pit.

Burial chamber and method: Irregular, shallow oval pit placed in the upper portion of a prior tomb (CF-31). The configuration of the pit is close to oval, oriented more or less north-south, but to the west it didn't show a very defined edge such that it is clear that this burial pit was quite shallow. Pit size was 90cm by 70 cm. The body and offerings were covered with loose dirt without stone markers.

Offerings: Three ceramic offerings and two unfired pinch pots. Ceramics included one CVCT tazón, one utilitarian ollita with carbon and one utilitarian vasija without carbon. One of the unfired pinch pots had burned material inside it. This material has not yet been analyzed.

Notes from Bonnie Yoshida on the skeletal remains:

Adult female, aged 25 to 35 years, skull displays fronto-occipital cranial deformation.

The pinch pots were placed on top of one the another. The top one had carbonized material in it

Body on the left side, flexed, head to the north, facing east

Burial CF-30 R-1181 Sector A1

Description of the burial and offerings:

Late Piñami burial completely excavated by Proyecto Piñami in 2003. Context info complete.

Context of burial: Late Piñami occupation. The burial was found in a cluster of burials that cut into the residential space so this burial may have been placed in an area that had been abandoned and transitioned to a cemetery context.

Body position: CF-30 was lying on its back. It is worth noting that the baby was placed very close to CF-29 (an adult woman) to the front of her, about 10 cm above her knees with clay between the two. While CF-30 is possibly associated with CF-29 it was placed sometime after CF-29.

Orientation of body: The head was toward the north though the position is very irregular and it was probably facing up. Part of the arms were found crossed to the east of the body aligned perpendicular to the body. The body might originally have been facing east. The body did not show any evidence of flexing though hard to tell since the leg bones were missing. Size of burial: 45 cm by 15 cm.

Possible body wrappings: None.

Burial type: Burial at surface level.

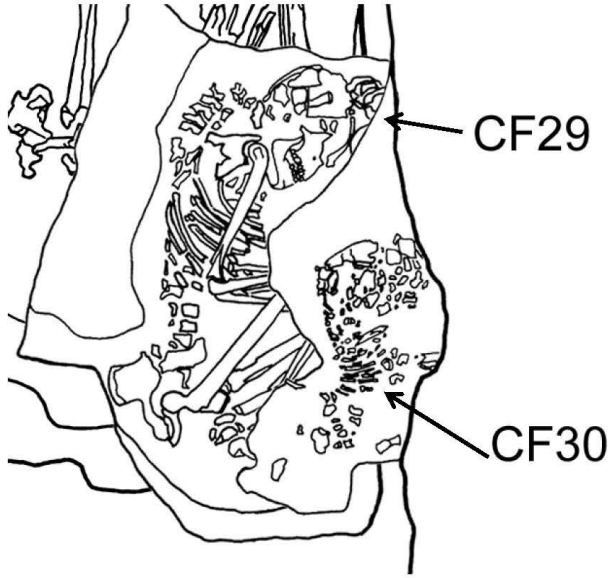
Burial chamber and method: The body lay in a shallow depression on a base of hard and irregular clay. There was no evidence of excavation to make a pit; body likely placed on a surface depression and covered with dirt.

Shape of burial: N/A. Body appeared to have been laid on the irregular surface and covered with dirt rather than into a pit. No shape.

Offerings: None.

Notes from Bonnie Yoshida on the skeletal remains:

Young juvenile, age 6 months +/- 3 months



Drawing by Gori Tumi Echevarría

Burial CF-31 R-1185-A Sector A1

Description of the burial and offerings:

Late Piñami burial excavated completely in 2003 by Proyecto Piñami.

Context of burial: Late Piñami Phase. The burial was found in a cluster of burials that cut into residential space so this burial may have been placed in a domestic area that had been abandoned and later used as a cemetery.

Body position: Flexed on the right side.

Orientation of body: NNE/SSW with axis of tomb and body slightly to the east of north. Head of the person was to the south facing east-southeast.

Possible body wrappings: Small evidence of white or fibrous material found below some bones.

Burial type: Burial in rectangular tomb.

Burial chamber and method: Rectangular in plan and quadrangular in cross-section. The tomb was constructed like CF-28, by making a concave cut in the ground and then constructing walls inside of the pit. Notably, in CF-31, the constructed walls were placed adjacent to the cut walls without fill between (unlike in CF-28). At the base of the tomb, a small round pit (20 cm in diameter and 30 cm deep) was found in the middle of the tomb floor. This pit contained carbon and some camelid bones including a jaw and rib bones. On top of this floor and covering the entire floor and sealing the pit was a thick layer (10 cm) of clay. The body was placed on top of this layer. In addition, the tomb chamber was made smaller by adding an extra layer of blocks of clay to the south of the pit so that the body fit exactly into the burial chamber space. This layer only extended about half way up the tomb wall. The body was covered with a fill of blocks of yellow clay and dirt.

Offerings: One small ollita with the body; in the small hole under the body , below a layer of clay, there was carbon and a few camelid bones.

Notes from Bonnie Yoshida on the skeletal remains:

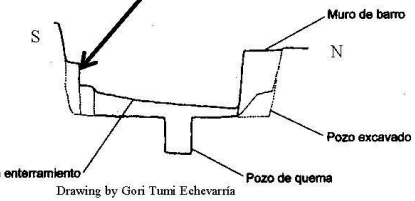
Adult 35-45 years old, possible female

Tomb was rectangular and constructed with blocks of clay.

Body on the right side, flexed, head to south, facing east,

Extra wall of blocks added to the south made the chamber smaller at the base of the tomb.

Cross section of burial pit showing base of tomb above offering pit.



Drawing by Gori Tumi Echevarría

In center of the tomb beneath the body was a round hole with carbon and camelid jaw and rib bones

Burial CF-32 R-260 Sector C

Description of the burial and offerings:

Late Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT.

Context of burial: In an outdoor patio area of a habitation near a large hearth. Late Piñami phase.

Body position: Flexed, lying on the right side.

Orientation of body: Axis of tomb and body was slightly east of north. The person's head was to the north and was facing west-northwest.

Possible body wrappings: None.

Burial type: Body deposited in a pit and covered with adobe bricks of various sizes.

Burial chamber and method: Irregular, generally oval pit. The walls and particularly the base of the pit were very irregular. Irregular oval in plan at the mouth of the tomb, more triangular shaped in plan at the base; in cross-section slightly trapezoidal with the base smaller than the rim of the pit. The southern portion of the burial was cut into by a later occupation. The burial itself cut into ash pits and hearth areas from previous occupations.

The body of the person was covered with modeled blocks of adobe. These blocks varied in size and some were broken prior to placement. The blocks were placed directly over the body, forming a covering (triangular in cross-section). It is likely these adobe bricks were in a secondary context and had been originally made for an architectural rather than funerary context. After placement of the adobe bricks, the pit was filled in with dirt. There was no cover over the pit but a layer of clay was smoothed over the entire section of floor above the burial to even it out with the floor of the patio.

Offerings: No offerings.

Notes from Bonnie Yoshida on the skeletal remains:

Middle to older adult (40+ years), probable female

The body was covered with large adobe bricks of various sizes.

Burial CF-33 R-504 Sector A1

Description of the burial and offerings:

Late Piñami burial completely excavated in 2003 by Proyecto Piñami.

Context of burial: Late Piñami phase burial. The burial was cut into habitation layers but might have been part of a burial cluster (re-use of a habitation space for burials). Due to the limited size of the excavation area, it is unknown if these was cut into an interior or exterior space.

Body position: Flexed, lying on the left side

Orientation of body: West southwest/east northeast with the head of the infant toward the southwest facing north/northwest.

Possible body wrappings: This is one of the burials with the clearest evidence of the wrappings for the body. These were preserved as texture in the mud and by white material. The body was wrapped completely so that we find evidence of wrappings both below and above the body.

Burial type: Simple pit burial.

Burial chamber and method: Simple, round to oval pit at the base in plan view. Slightly trapezoidal ("A" shaped) in cross-section. After deposition of the body, the pit was filled in with blocks of yellow clay and dirt..

Shape of burial:

Offerings: No offerings.

Close up showing texture imprints from wrappings

Notes from Bonnie Yoshida on the skeletal remains:

Infant (juvenile) age 6 months +/-3 months

Burial was in a round/oval A-shaped pit. Fill consisted of dirt and blocks of yellow clay

Body flexed on the left side facing roughly north,

Burial CF-34 R-296 Sector C-1

Description of the burial and offerings:

Late Piñami burial completely excavated in 2003.

Context of burial: Hard to say as the burial was found at the base of a garbage pit and was constructed before the excavated layers and significantly before the garbage pit. The burial was likely from early in the Late Piñami phase.

Body position: Seated flexed.

Orientation of body: The back was against the southeast wall of the pit and the body was facing northwest.

Possible body wrappings: Significant white powdery material and whitened vegetable fibers were found around the body in a circular pattern, suggesting originally there was a bundle. The treatment is very similar to CF-26.

Burial type: Deposition in a round pit.

Burial chamber and method: A small round pit in plan with a very regular shape and a flat base that was cut by another pit above it. The cross-section was semi-circular with the base larger than the opening.

Offerings: No offerings.

Body seated flexed facing west, body was slumped forward and flattened

Notes from Bonnie Yoshida on the skeletal remains:

Child 5yrs +/- 16 months

Burial CF-35 R-299 Sector C-1

Description of the interment and offerings:

Early Piñami stone covered chamber. CF-35 was found at the base of CF-34. Presumed to be a stone tomb based on similarity with others. Found at the end of the field season so was not excavated.

Context of burial: The feature/burial likely correlates to the Early Piñami phase of the mound occupation.

Body position: Unknown.

Orientation of body: Unknown.

Burial type: Stone covered tomb.

Burial chamber and method: Stone covered chamber. Likely tomb. Not enough excavation to determine if it was rectangular or round. However, the burial was not filled in with dirt. Very similar to construction of other stone tombs.

Offerings: Unknown.

Notes from Bonnie Yoshida on the skeletal remains:

No skeletal material

Burial CF-36 R-207 Sec C exterior south (page 1 of 2)

Description of the burial and offerings:

Illataco-Early Piñami burial completely excavated in 2004. Extensively photographed.

Context of burial: Complete context unknown. Burial was discovered on the exterior of the mound with half of the burial under the mound. The vertical position in the mound indicates Illataco/Early Piñami context.

Body position: Unknown. The body was completely fragmentary and was incomplete. There were no teeth found nor any evidence of a head..

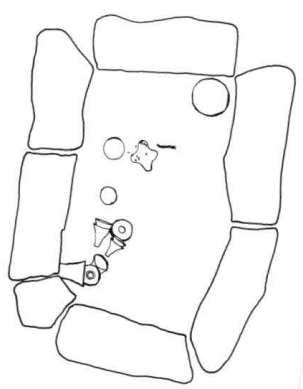
Orientation of body: The long bones were arranged along the axis of the tomb which was slightly east of north (10-15 degrees). There was a set of beads and a silver plaque to the north possibly indicating the original placement of the head to the north. If the head was removed, it was done pre-historically.

Possible body wrappings: There was extensive evidence of burial treatment in this tomb. We found bark wrappings, white vegetable fibers, and white powder. Layers of bark or other spongy plant materials were found over the body. The body was completely enveloped in this funerary material.

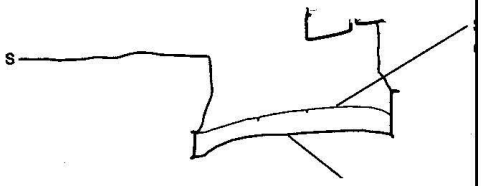
Burial type: Deposition in rectangular tomb.

Burial chamber and method: Rectangular in plan, basically quadrangular in cross-section though the opening was slightly smaller than the base. The walls showed a mix of techniques. The base walls were lined with stones placed horizontally. Over this base, the walls were lined with blocks of clay with mortar of darker clay. These clay layers also had a horizontal tendency. The rim of the tomb was lined with stones which provided a foundation for laying large cover stones across the width of the tomb. The upper walls of the tomb show evidence of plaster. The interior base of the tomb had a layer of thick clay (15+ cm thick) laid down in large rectangular pieces (see photo next page) which was used as a floor for the body.

Notes from Bonnie Yoshida on the skeletal remains: Adult, no age or sex information.



Drawing by Gori Tumi Echevarría



Drawing by Gori Tumi Echevarría

N/S cross section of tomb showing base of tomb and layer of clay blocks

Interior of tomb at the level of the body and its wrappings. Line of beads are exposed here

Base of tomb showing partial excavation of the rectangular blocks forming the tomb floor

Interior of tomb showing façade of tomb formed by layer of stone followed by layers of adobe blocks and darker clay as mortar

Burial CF-36 R-207 Sec C exterior south (page 2 of 2)

Offerings: This is one of two burials with unusually high number of offerings and CF-36 has the greatest variety of offerings: 12 ceramic vessels, at least 3 unfired vessels made of dark brown clay (not pinch pots), at least 3 plaques of metal (one a silver cross-shaped engraved plaque, one crumpled silver plaque and one crumpled copper plaque), stone beads that formed a necklace, other special beads, evidence of at least one basket, camelid bones.

Imported Tiwanaku vessels (3): vasija with volute design (no handle); large challador; large tazón. The large challador is surprising since it is a more Cochabamba form but the paste was clearly imported.

Possible import or local Tiwanaku (1) : blackware kero has a paste that is not diagnostic of the highlands; however most blackware is imported. Could be a rare example of CVCT blackware.

CVCT (2): small tazón with volute design; small vasija with handle, also with volute design.

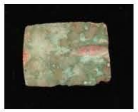
Vessels that have more local attributes than typical CVCT (6): The two pairs of cups and the small kero are unusual. They use a rough texture slip and are not burnished. The four identical kero/challadores forms use a Caraparial motif. The small kero with horizontal stripes has iconography that is not diagnostic of Tiwanaku or CVCT. One other vessel that is local is a small vasija with handle; it has an interlocking black and red volute motif that is more typical of Mojocoya than Tiwanaku.

The four identical small kero/challadores were buried in pairs of one inside the other.

Layers of tree bark in a tazón

Base of broken blackware kero shows remains of what might be maize leaves

Metal Plaques



Partially worked bead

Worked bone

Beads found on exterior of wrappings near neck

Broken unfired vessel inside a challador

Paired cups found one inside the other

Imprint of a mat or basket on the base of a tazón

Burial CF-37

R-2050 Sector B, PLANE Level ~15/16

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited photos by KA in 2002. Excavation completed in 2004.

Context of burial: Found in Early burial cluster, Illataco/Early Piñami phase.

Body position: Unknown, body was disturbed and fragmentary

Orientation of body: Unknown.

Burial type: Unclear, likely a simple pit burial.

Burial chamber and method: The original form of the burial was impossible to determine due to destruction of the area during PLANE excavation. Only the grouping of offering vessels was exposed, not the entire burial chamber. The remaining human remains, excavated in 2004, were found grouped at the base of what appeared to be a small irregular pit.

Offerings: 3 ceramic vessels all local in style: a tazon, a vasija with single handle, and a utilitarian, double-handled ollita. The two painted vessels were Cochapampa style.

Notes from Bonnie Yoshida on the skeletal remains:

Juvenile, (child) 3 years +/- 12 months

Burial CF-38

R-2055 Sector B, PLANE Level ~16

Description of the burial and offerings:

Illataco burial completely excavated in 2004 by Proyecto Piñami.

Context of burial: Horizontal context unknown, it was found in the of burial cluster though below one of the main tombs of the cluster. Likely Illataco phase.

Body position: Due to disturbance from Tomb CF-51 (R-2036), the nature of the deposition could not be completely determined. Despite this, teeth, vertebral bones and a few other bones were found. The burial appears to have been incomplete originally, possibly a secondary burial.

Orientation of body: N/A. The few bones that remained did not fit together anatomically. Likely a secondary burial.

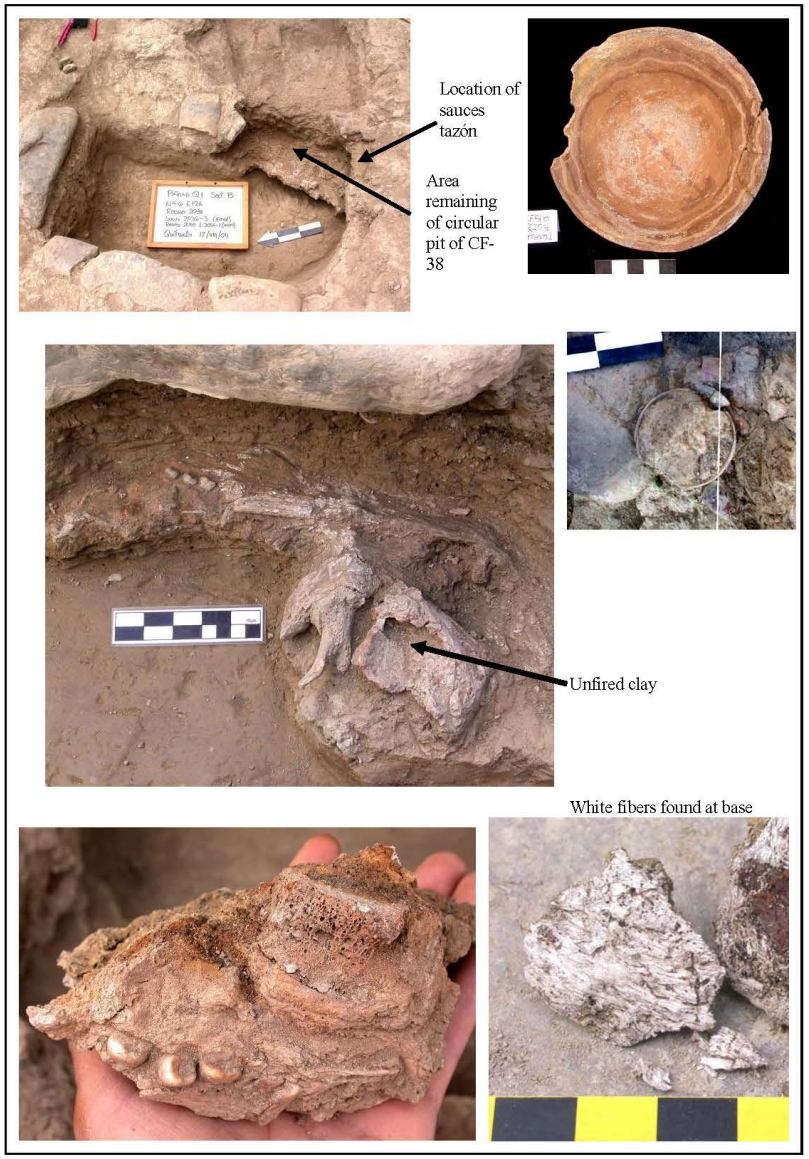
Possible body wrappings: Extensive presence of white vegetable fibers and white powder around all the remains.

Burial type: Burial in irregular round pit.

Burial chamber and method: The burial chamber was difficult to determine since it was cut by Tomb 9 (CF-51). From what we have left, it appears to be an irregular circular pit in plan with a semi-circular cross-section and flat base. The pit had a white interior in both the walls of the pit and the base.

Offerings: 1 unfired piece of red clay plus 1 likely associated Sauces tazón. Only the unfired clay was directly associated with the human remains. The tazón was found in the prior season and was originally thought to be associated with T-9/CF-51. However, it was slightly outside the T-9 corner stone (not within the chamber) and turned out to be directly above the CF-38 burial remains so it is likely associated with CF-38.

Since CF-38 was disturbed, whether what we have is the full grave lot is unknown.



Notes from Bonnie Yoshida on the skeletal remains:

Adolescent, 15 years +/- 3 years (note: this may be the same individual as CF-67, also an ~ 15 year old adolescent)

Burial CF-39a R-2058a, Sector B, PLANE Level ~14

Description of the burial and offerings:

Early Piñami burial completely excavated by Proyecto Piñami in 2004.

Context of burial: The burial was located within the early burial cluster., Early Piñami Phase. The exact context was unknown but likely was a cemetery context. Whether A and B are related or it was coincidence that A almost completely re-opened up B is unknown. However, it is clear that A was placed at a later time than B and A expanded the burial pit a bit.

Body position: Seated flexed.

Orientation of body: Facing W or WNW (back toward the ESE of the pit). The body had a clear circular rust colored mark around it at the base.

Possible body wrappings: Extensive presence of white vegetable fibers, practically covering the body and the offering vessels.

Burial type: Burial in irregular round pit.

Burial chamber and method: This was an intrusive pit that cut into a previous burial (CF-39b). This circular burial expanded the pit of 39B giving the entire pit an oval form. However, each burial was round in plan and slightly semi-circular in cross-section with a slightly concave base. CF-39a had a large rectangular stone standing upright in clay above the offerings and the body. The standing stone was could be a marker stone. (See CF-18 for a single stone associated burial.) The stone was situated directly above the offering vessels (which were fractured by the weight of the stone) and slightly in front of the body. In addition to the standing stone, blocks of yellow clay were part of the fill above the body.

Offerings: 4 ceramic vessels—These vessels were found at the base of the marker stone at the level of the head of CF-39a and completely above the remains of CF-39b such that we assume that all four vessels were offerings associated with A and not B. The two painted vessels, the kero and tazón, are CVCT. The others are utilitarian, one ollita with carbon and one vasija.

Notes from Bonnie Yoshida on the skeletal remains:

Juvenile, 8 yrs +/- 9 mo

Body seated flexed facing west

Vasija with white fibers

Burial CF-39b

R-2058b Sector B PLANE Level ~14

Description of the burial and offerings:

Illataco-Early Piñami burial completely excavated by Proyecto Piñami in 2004.

Context of burial: The burial was located within the early burial cluster, Early Piñami/Illataco Phase. The exact context was unknown but likely a cemetery context. CF-39b was directly below CF-39a. Whether A and B are related or it was coincidence that A almost completely opened up B is unknown. However, it is clear that A was placed at a later time than B.

Body position: Seated flexed.

Orientation of body: Facing east southeast with back to the west northwest of the pit.

Possible body wrappings: Extensive presence of white vegetable fibers and white powder over and below the body.

Burial type: Burial in irregular round pit.

Burial chamber and method: Circular pit with a slightly concave base and a semi-circular cross section. The base of the tomb was excavated into sterile soil. The fill and covering of the tomb was disturbed in antiquity by 39-A which cut into it. This burial had a clear circular dark stain at the base of the body.

Offerings: No offerings.

Notes from Bonnie Yoshida on the skeletal remains:

Adolescent 15 years +/- 6 months, indeterminate sex.

Body seated flexed facing ESE

Close up of white vegetable fibers

Burial CF-40 R-2066 Sector B, PLANE Level ~15

Description of the burial and offerings:

Excavated in 2004 by Proyecto Piñami. The area was highly disturbed in 2002 by PLANE.

Early Piñami Phase context

Context of burial: Unknown. Highly disturbed burial. Only cranium remained.

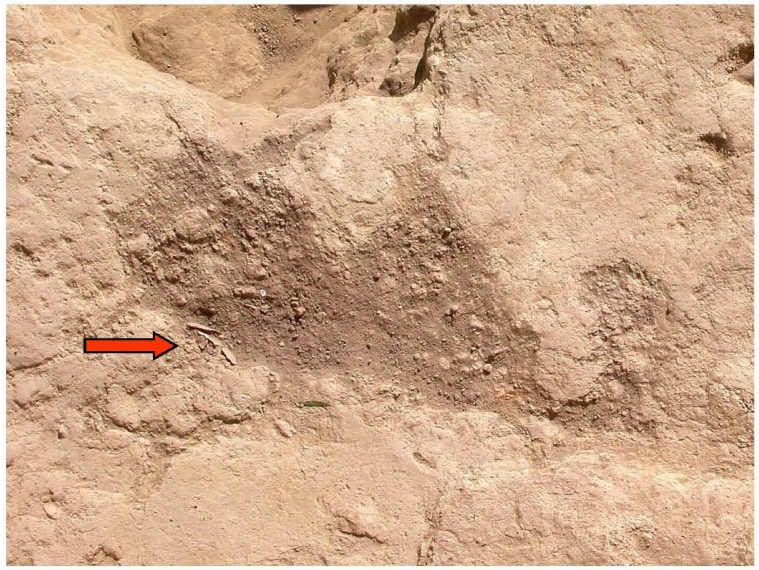
Body position: Unknown.

Orientation of body: Only a few cranium pieces remained.

Burial type: Unknown, possible pit burial. Possibly the base of a burial that was removed by PLANE.

Burial chamber and method: The remains were found in an area with loose dirt and ashes, not in a clear burial pit.

Offerings: Unknown.



Notes from Bonnie Yoshida on the skeletal remains:

Juvenile based on cranial vault thickness

Burial CF-41

R-2071 Sector B, PLANE Level ~15

Description of the burial and offerings:

Possibly a burial context but this is not confirmed. A vessel was found in the west profile of Sector B by a worker. The area was not excavated. The area around the vessel had open space and possible cover stones and, based on comparisons with other areas, it was likely part of a burial.

Context of burial: Unknown.

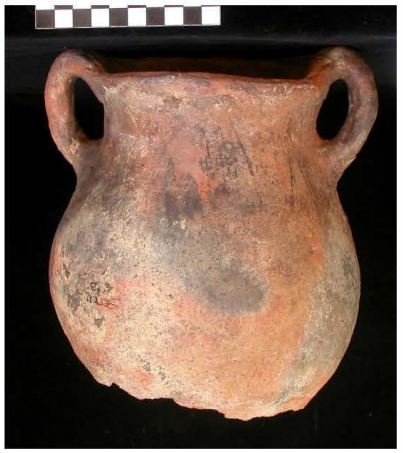
Body position: Area was not excavated. Presence or absence of skeletal materials is unknown.

Orientation of body: None found.

Burial type: N/A

Burial chamber and method: Unknown, however, presence of stones above the open space where the olla was found is suggestive of a stone-covered tomb.

Offerings: Only a single olla was found by a worker. A long copper needle was found close to where the olla was found but impossible to say if it was related. No other vessels were reported and the area was not excavated.

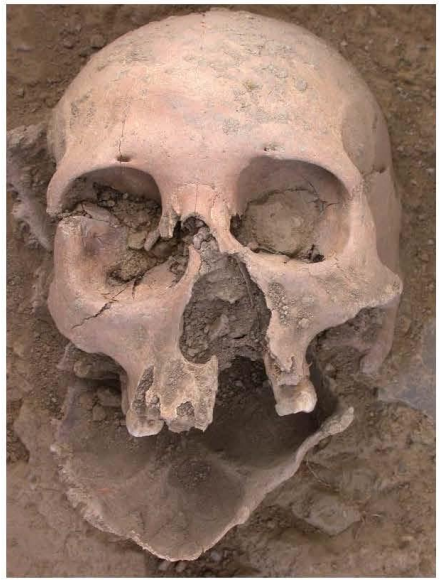


Olla was found in an open space found in the west profile of sector B.

Notes from Bonnie Yoshida on the skeletal remains:

No skeletal material

Burial CF-42 R-2075 Sector B ext. north



Description of the burial and offerings:

Skull found on cleaning the exterior of the site to the north of debris and plants. No other body parts were found associated.

Context of burial: The horizontal context (if the context is original which is uncertain) would be Early Piñami phase.

Body position: Unknown. Only the head was found.

Orientation of body: Head was face up with top of the head to the south. It is not certain that this was the original position.

Burial type: Unknown

Burial chamber and method: Unknown.

Offerings: N/A

Notes from Bonnie Yoshida on the skeletal remains:

Adult, sex unknown.

Burial CF-43 R-25 Sector C exterior north

Description of the burial and offerings:

Late Piñami burial excavated by Proyecto Piñami in 2002.

Context of burial: Unknown, burial found outside of excavation unit to the north of Sector C. However, relative horizontal placement suggests a Late Piñami phase context.

Body position: Inside of urn at the base.

Orientation of body: Unknown—skeletal material was too fragmentary.

Burial type: Urn burial.

Burial chamber and method: The urn (a tinaja) was placed in the ground right side up. The upper half was broken off. The body was placed in the base of the vessel and the offerings were placed inside the urn around and above the body.

Other: A few lumps of pure yellow clay were found inside of the burial urn. Probably these were placed on top of the burial as a cover or seal. The urn had broken outward over time (see lower right photo).

Offerings: Not including the tinaja, there were 4 ceramic offerings – a CVCT kero, an ollita, a small vasija and a small tazón – plus two small unfired pinch pots. The kero is CVCT and the ollita and vasija appear local.

The tinaja appears imported form Tiwanaku. It had very hard paste, a white wash over the exterior, a combed surface and temper of caliche all typical of tinajas from Tiwanaku (Janusek 2003:60).

The tazón is unlike Tiwanaku or local styles in terms of both form and iconography. Though quite eroded, still visible are unusual red bands outlined in black along the rim and base of the exterior. In addition, the form has quite straight sides instead of the slightly flaring form of Tiwanaku or CVCT tazones.

Offering summary of styles: Mix of CVCT, imported Tiwanaku (tinaja) and one unknown foreign style vessel.

Notes from Bonnie Yoshida on the skeletal remains:

Infant, 9 months +/- 3 months

Offerings not shown in photo above: one unfired pinch pot

Tinaja: Imported Tiwanaku

Kero: CVCT

Tazón: Unknown style from both iconography and form

Util vessels: local pastes and typical MH forms.

Tazón of unknown style—has red stripes at base and rim outlined in black

Burial CF-44

R-2016 Sector A, PLANE Level ~16

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE in 2002. Limited notes and photos by KA and ZT. The burial was not re-excavated.

Context of burial: Illataco phase or Early Piñami Phase. Was within the early burial cluster so likely a cemetery context.

Body position: Unknown

Orientation of body: Unknown.

Burial type: Deposition in a tomb. Stone walls and possibly cover stones.

Burial chamber and method: The chamber was square in both plan view and cross-section. It was quite small with each wall composed of one longitudinally standing stone forming regular 90 degree angles at the corners and a formal design. The chamber is too small for an adult burial. It may have been for a child or was only for offerings.

This style of chamber using single upright slabs for wall is similar to construction methods of the Late Formative found at Sierra Mokho by Döllerer (2013).

Offerings: 2 ceramic vessels: a small unpainted vasija (local style) and a CVCT style tazón.

Notes from Bonnie Yoshida on the skeletal remains:

No skeletal material.

Burial CF-45 R-2017 Sector A, PLANE Level ~15

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT. Re-excavated in 2005

Context of burial: Illataco or Early Piñami phase. It was found in the cluster of burials so may be part of a cemetery context from this period.

Body position: Seated flexed.

Orientation of body: The back was resting on the southeast wall of the tomb with the body facing to the northwest..

Body treatment: Flat base stone placed under where the body was seated. There were extensive remains of white vegetable fibers, particularly under the body. Other fibers may have been present but were disturbed.

Burial type: Deposition in a round tomb—earth pit with ring of rim stones and stone cover.

Burial chamber and method: A pit tomb with a circular shape in plan and possibly rectangular in cross section. The tomb apparently was a cut pit with rim stones and cover stones, similar in structure to CF-54. Hard to say exactly since we have only limited photographs from 2002 and the tomb suffered the effects of erosion before our re-excavation in 2004.

Offerings: 3 ceramic vessels: 1 Cochapampa jarrita, 1 ollita with carbon, and one Sauces style tazón.

Notes from Bonnie Yoshida on the skeletal remains:

Adult, 30-40 years old; possible male; possible erosive lesion of the vertebre

Offering not in photo: small unfired pinch pot.

Appearance of tomb cap stone during PLANE excavation (rim stones of CF-46 are visible to the right)

Circle shows outline of round burial chamber. The roof and rim stones were removed by PLANE before analysis.

Body seated flexed facing northwest and seated on a flat base stone (above)

Burial CF-46 R-2018 Sector A, Level 18

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE in 2002. Very limited notes and photos by KA and ZT. Re-excavated in 2005 but tomb had suffered severe water damage in the intervening time. One photo shows a possible marker stone or part of the cover stones appearing in Level 15. The collar of the tomb seen in the photo was at Level 18. There are no photos or records of the tomb cover, if any.

Context of burial: Illataco or early Piñami phase. It was found in the cluster of burials so may be part of a cemetery context from this period.

Body position: Unknown. Some human remains seen in original photos but clearly fragmentary. No bones remained upon re-excavation.

Orientation of body: N/A

Burial type: Cut rectangular tomb with stone rim stones and likely stone cover.

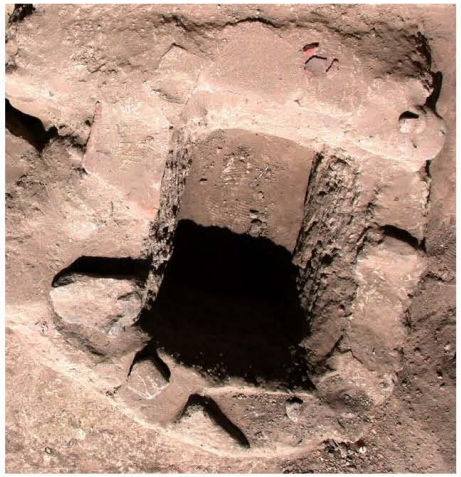
Burial chamber and method: A cut pit tomb with a rectangular plan and a quadrangular cross-section. The axis of the burial was aligned NNE/SSW (approximately 15 degrees east of north). The chamber was elaborately excavated and the interior walls were quite uniform. In addition, there was a rim of stones around the mouth of the tomb. The rectangular shaped rocks were laid out horizontally. We don't have any photographic evidence or notes about a stone roof though we presume there was one as all other burials with stone rims had stone covers.

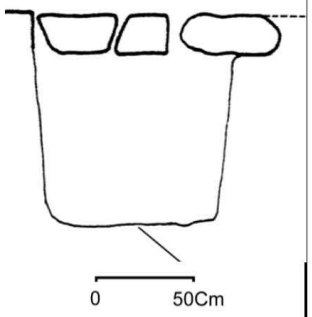
Offerings: No offerings recorded though one small vasija is visible in the photo from the PLANE excavation (see above right photo).

Notes from Bonnie Yoshida on the skeletal remains:

No skeletal material was found..

View of rim stones during PLANE excavation. One offering vasija is visible in the photo that was subsequently lost.





Drawing by Gori Tumi Echevarría

Plane view of burial chamber showing rectangular shape and east of north orientation

Burial CF-47

R-2019 Sector A3, PLANE Level ~15

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited photos by KA. Re-excavated in 2005 for skeletal remains.

Context of burial: Burial cluster, cemetery, Illataco or Early Piñami Phase.

Body position: Seated flexed. The body was found slumped to the left. Original position was difficult to determine due to disturbance post 2002.

Orientation of body: Back to the south and body facing north-northwest.

Possible body wrappings: The second excavation in 2005 did not find any plant fibers or other evidence of wrapping or body treatment. However, the photos from the 2002 excavation show that there were plant fibers and white material on the offering vessels.

Burial type: Deposition in a cut pit tomb. Round pit with rim stones and stone cover.

Burial chamber and method: The burial chamber was round in plan and quadrangular in cross-section. The pit had two courses of stones at the rim which roughly followed the round plan form of the tomb. The tomb must have originally had cap stones, since the tomb was not filled in with dirt.

Offerings: 3 ceramic vessels (two jarritas, one tazón), likely at least one unfired vessel (some unfired clay was found during excavation). One jarrita was Sauces. The other jarrita and the tazón were imported. The tazón appears similar to those described as characteristic of Lukurmata with a tan paste and a red interior and exterior rim band. The jarrita is clearly imported Tiwanaku as the paste has gold mica and the slip color is redder than used in CVCT. This jarrita has a modeled and painted front facing human head on the body. The chin length hair and features were painted in black (unfortunately quite eroded).

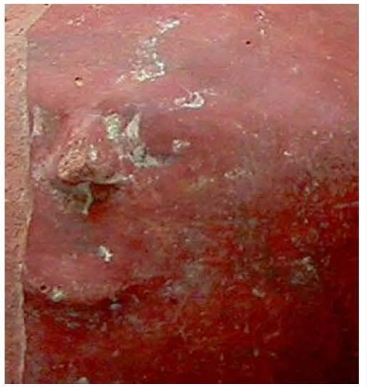
Note: Top photo is misnumbered as CF-64

Notes from Bonnie Yoshida on the skeletal remains:

Adult, age and sex indeterminate.

Jarrita (left): Tiwanaku import
Tazón: Import possibly from Lukurmata
Jarrita (right): Local Sauces style

Double course of stones at rim of chamber.



Close up of human head on jarrita.

Body seated flexed facing north/northwest

Burial CF-48

R-2020 Sector A, PLANE Level 15

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT. Re-excavated in 2005 for skeletal remaining material.

Context of burial: PLANE Level 15. No exact context info; however, likely cemetery context as it was found within the Early Burial cluster. Based on horizontal position, Illataco/Early Piñami phase.

Body position: Seated flexed with the back to the east of the pit facing west.

Orientation of body: The body was quite disturbed due to PLANE but the hip and vertebra appear to have remained in place. Thus the body appears to have been facing west or west/northwest.

Burial type: Deposition in a tomb, simple pit with cover stones.

Burial chamber and method: Based on what remained upon re-excavation, the tomb appeared circular to oval in shape with a semi-circular cross section. However, it is possible that the tomb was circular in plan with a quadrangular cross-section. The burial pit did not have any rim stones so the large cover stones were placed directly over the opening resting on earth.

Other: There was a base stone at the base of the tomb under where the body would have been sitting.

Offerings: No information.

Notes from Bonnie Yoshida on the skeletal remains:

Adult male, 30-40 years (middle adult)

Cover stones

Body seated flexed facing west northwest and was seated on a flat base stone

Flat flagstone was under the seated body.

Burial CF-49

R-2013 Sector A3, PLANE Level ~13

Description of the burial and offerings:

Early Piñami burial excavated completely by PLANE. Limited photos by KA. No notes.

Context of burial: Unknown, this burial appeared in layers above the Early Burial cluster. It may be related to the cemetery area below or be independent. Vertical position suggests late in the Early Piñami Phase.

Body position: Unknown. Bones were fragmentary and not recorded in detail by our team.

Orientation of body: Unknown.

Burial type: Deposition in rectangular tomb. Earthen pit with cover stones.

Burial chamber and method: A tomb with a rectangular plan and quadrangular cross-section. Some or all of the tomb walls had been finished with a layer of smoothed mud (visible in the photos).

Offerings: Based on photographs, 5 ceramic vessels, one unfired double chamber pinch pot, and one additional unidentified pinch pot (in fragments). From the photos, the tazón is clearly Tiwanaku or CVCT in style as is the small vasija. There is an angular kero that is likely CVCT in style. The only vessel that remains in the collection is the challador which is CVCT style.

Notes from Bonnie Yoshida on the skeletal remains:

No skeletal material retained.

All the stones shown were from the tomb cover but are not in their original configurations.

Aside from this challador, all the offering vessels are missing from the collection

Offerings from burial.

The walls of the chamber were finished by application of a layer of smoothed mud

Burial CF-50

R-2035 Sector B, PLANE Level ~16

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited photos by KA in 2002. Re-excavated for skeletal remains in 2004.

Context of burial: Context unknown, however, it was located within the burial cluster so likely in a cemetery context. Illataco/Early Piñami phase burial.

Body position: Unknown, the body of the infant was very fragmentary.

Orientation of body: Could not be determined.

Burial type: Deposition in a pit tomb with a stone cover (no photos of cover available).

Burial chamber and method: A small tomb with a circular plan (almost quadrangular at the opening) and with a quadrangular cross-section. The tomb had a stone cover with the stones aligned parallel and horizontally.

Shape of burial: Circular in plan and quadrangular in cross.

Other: The tomb had a round flat stone at the base underneath the body.

Offerings: 4 ceramic vessels (tazon, two vajijas with handle, one ollita); one double-chamber, unfired pinch pot; and possibly another unfired small vessel. The tazón is clearly Sauces style. The open mouth vasija with handle appears CVCT in technique though the iconography appears to be a permutation of the Tiwanaku volute. The round bodied vasija with handle is too eroded to determine the original style; the only paint left is in some black vertical lines at the rim.

Notes from Bonnie Yoshida on the skeletal remains:

Juvenile, 18 months +/- 6 months

Missing from offerings photo above: one double hole unfired clay pinch pot (seen below).

Base stone placed under the body

Burial CF-51

R-2036 Sector B, PLANE Level ~14

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT. Additional excavation in 2005, no skeletal remains found.

Context of burial: No context available for the opening of the tomb. However, the tomb was found in the cluster of burials in the early layers of the mound so Illataco or Early Piñami Phase context, likely in a cemetery cluster.

Body position: No human remains present after PLANE excavation.

Orientation of body: N/A

Burial type: Rectangular, stone-lined and stone covered tomb.

Burial chamber and method: The tomb was rectangular in plan and quadrangular in cross-section. Very formal design. The interior walls of the tomb were formed by the regular layout of four courses of stones with the most flat part of each stone facing the interior of the tomb for a flat walled façade. The long axis of the tomb was 15-20 degrees east of north. The cover of the tomb was composed of long stones arranged crossing the width of the tomb with smaller fill stones for the spaces between the large stones.

Offerings: 7 ceramic vessels: CVCT kero; CVCT challador (with some local banding and unusual color counterchange); undecorated vasija with unusual single handle; two tazones (vessel #s 65 and 67) that are eroded, possibly CVCT or Cochapampa; two small double-handled vasijas that appear to be Cochapampa style.

Cover stones

Interior layout was four courses of stones; top two courses visible in photo

First appearance of offering vessels

Notes from Bonnie Yoshida on the skeletal remains:

No skeletal material found recorded.

Burial CF-52 R-2037 Sector B, PLANE Level ~14

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT. Re-excavated in 2005.

Context of burial: The burial was located within the early burial cluster (Illataco/Early Piñami). The general context was unknown but likely was a cemetery context.

Body position: Unknown, likely flexed on the side based on the tomb shape.

Orientation of body: Unknown. However, the axis of the tomb is NNE to SSW.

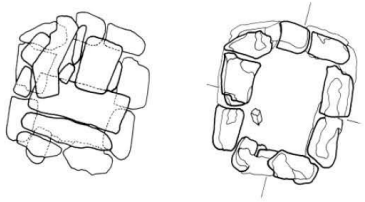
Burial type: Deposition in a rectangular tomb.

Burial chamber and method: A stone tomb, rectangular in plan and quadrangular in cross section with an east of north orientation of the tomb axis. The walls had a very regular layout with a regular horizontal tendency. There were four courses of stones in the walls. One of the wall stones was a used broken grinding stone. It was placed with the polished grinding surface facing into the tomb. The cover was formed by the use of four large stone slabs (80 kg or more each). The rocks were placed with two slabs perpendicular to the central axis of the tomb and two parallel. The placement of the stones gave the roof a slightly triangular shape seen in cross-section of the main tomb axis. The tomb roof was sealed with small stones use to block any holes remaining after placement of the four large slabs.

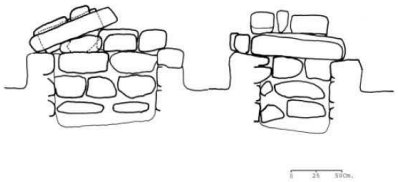
Offerings: 6 ceramic vessels. The one-handled vasija is clearly an import from the highlands as the paste is full of gold mica. The larger tazón is CVCT style. The remaining four vessels are undecorated. The two small tazones are not burnished and only roughly smoothed. The ollita has carbon on it. The vasija without handle is semi-burnished and unpainted. This last vessel was sealed with red clay in the burial but PLANE workers removed the seal and we have no notes on contents if any.

Notes from Bonnie Yoshida on the skeletal remains:

No skeletal materials remained.



The small undecorated vasija was sealed with red clay. This was removed and lost by PLANE and there are no notes on contents if any.



Drawing by Gori Tumi Echevarría

Burial CF-53 R-2039 Sector B, PLANE Level ~11

Description of the burial and offerings:

Early Piñami burial excavated by PLANE in 2002. Limited notes and photos by KA and ZT. Re-excavated by Proyecto Piñami in 2003 for skeletal material remaining.

Context of burial: The general context is unknown but likely was a cemetery context, as the burial was located within the Early Piñami burial cluster.

Body position: Unknown, likely seated flexed based on tomb form.

Orientation of body: Unknown however a few photos take from 2002 show some long bones arranged parallel, west/northwest to east southeast.

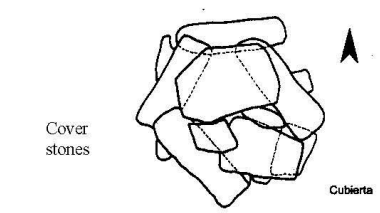
Burial type: Deposition in a round tomb.

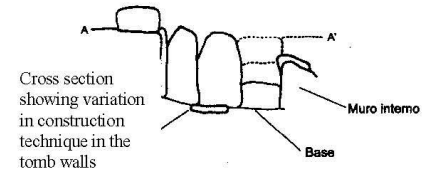
Burial chamber and method: A circular stone lined tomb (the only round stone tomb), quadrangular in cross-section with a flat base. The walls of the tomb were quite unique due to using two tendencies in the layout. One half of the tomb had walls formed by large rectangular stones placed in a standing position. These stones had a horizontal tendency with a set of stones placed vertically. The other half had a layout using smaller irregular stones laid out in three superimposed horizontal courses in order to reach the same height as the long stones. Smaller stones were used to fill in gaps in the tomb walls. At the rim there was a final layer of large stones laid horizontally to form a rim. The cover stones rested on this final and unified course of rim stones. The cover of the tomb was formed by the superposition of rocks forming a roughly triangular corbeled form seen in cross-section. From photos this cover would have been between 50 and 100 cm above the rim stones. (The stones of the tomb roof were repositioned by PLANE for the photo above right.)

Other: The floor of the tomb contained a large, round, flat base stone in the center of the tomb. Also, a circular dark stain was found at the base, as in other burials such as CFs 9, 13, 39a, 39b, 48.

Offerings: None recorded. Tomb was excavated by PLANE and there were no photos at the time of original opening.

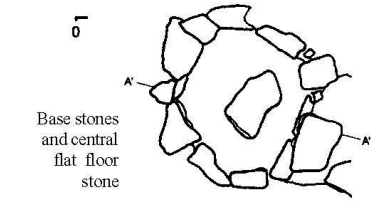
Notes from Bonnie Yoshida on the skeletal remains:
Extremely fragmentary skeletal material remained and no determination could be made. From photos of bones, the person was not an infant or young child, possibly adolescent or adult.





Cross section showing variation in construction technique in the tomb walls


Note: The tomb roof shown is a replacement of the original stones after excavation rather than upon first excavation.



Base stones and central flat floor stone


Close up of bones

Burial CF-54 R-2040 Sector B, PLANE Level 12

Description of the burial and offerings:

Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT. Re-excavated in 2004 for skeletal material.

Context of burial: The burial was located within the early burial cluster and likely Early Piñami context. The full context is not known but likely was a cemetery context.

Body position: Seated flexed.

Orientation of body: Facing east with back toward the west.

Burial type: Circular cut pit tomb with stone rim and cover.

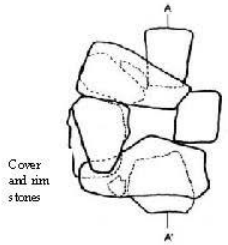
Burial chamber and method: Circular in plan and quadrangular in cross-section. The structure of the pit was simple with straight sides. The cover was made of two to three courses of stones forming a corbelled vault over the tomb. The stones placed directly along the rim of the pit were large rounded edge stones with some filler stones to fill holes and provide a solid foundation. Then a second course of angular stone set more close together was placed and extended a bit over the original rim closing in the opening. There was likely a third course or a single cover stone covering the hole left by the second course of stones but we have no notes or photos available on that point. The pit was not filled in with dirt after placement of the cover so the cover was complete earlier.

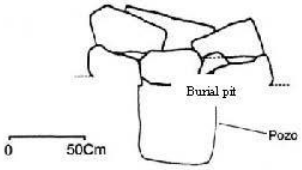
Offerings: Top of burial was exposed before PLANE stopped. We have no information if offering vessels were present and removed by PLANE. Only one small stone was associated with the body, approximately 15 cm by 10 cm by 5cm, though it is possible that this stone fell into the pit from the rim/cover stones.

Notes from Bonnie Yoshida on the skeletal remains:

Adult, possible male, no age info.

Stones placed on top of rim stones (second course of stones) forming the





Drawing by Goni Turni Echevarría

First course of stones around rim of burial pit

Rock in burial

Body seated flexed facing east

Burial CF-55

R-2041 Sectors A PLANE Level ~15 –

(extends into Sector B)

Description of the interment and offerings:

Illataco-Early Piñami burial found by PLANE. Limited photos by KA. The burial was not re-examined.

Context of burial: Unknown—this burial is close to the dense cluster of burials, so likely a cemetery context. Illataco/Early Piñami phase.

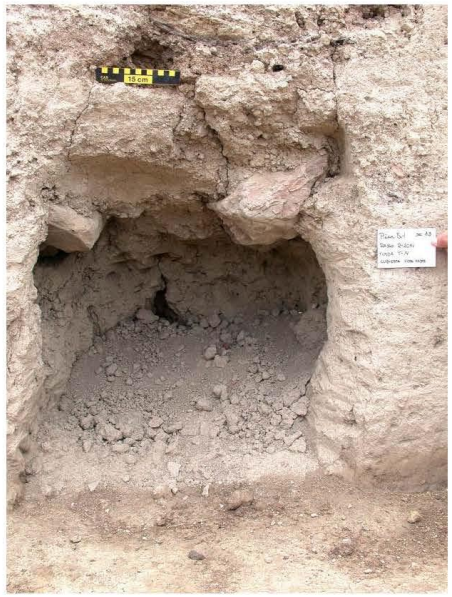
Body position: Unknown.

Orientation of body: Unknown.

Burial type: Possible deposition in stone covered tomb. Chamber was found cutting through the unexcavated "wall" between Sectors A and B.

Burial chamber and method: There were cover stones over an open chamber. Quadrangular in cross-section, plan form is undetermined due to the tomb location (crossing the balk between Sectors A and B).

Offerings: Workers reported vessels were removed during PLANE but how many and what type is unknown.



View from Sector A showing cover stones and interior of chamber

View from Sector B showing continuation of cover stones seen above . Grey stones to left of photo are from another tomb.

Notes from Bonnie Yoshida on the skeletal remains:

No skeletal materials retained.

Burial CF-56 R-2044-a Sector A, PLANE Level ~15

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Only photos by KA in 2002.

Context of burial: The burial was located within the early burial cluster. The exact context was unknown but likely was a cemetery context. Illataco/Early Piñami Phase.

Body position: Unknown.

Orientation of body: Unknown.

Burial type: Shallow pit burial with stone cover.

Burial chamber and method: From the photos it appears to be a very shallow pit (shape unknown) with cover or maker stones. The stones appear to be placed directly on top of the bones of the individual.

Offerings: None recorded.

Notes from Bonnie Yoshida on the skeletal remains:

No skeletal materials were analyzed. The bone remains were very fragmentary, the context was contaminated before samples could be retrieved.

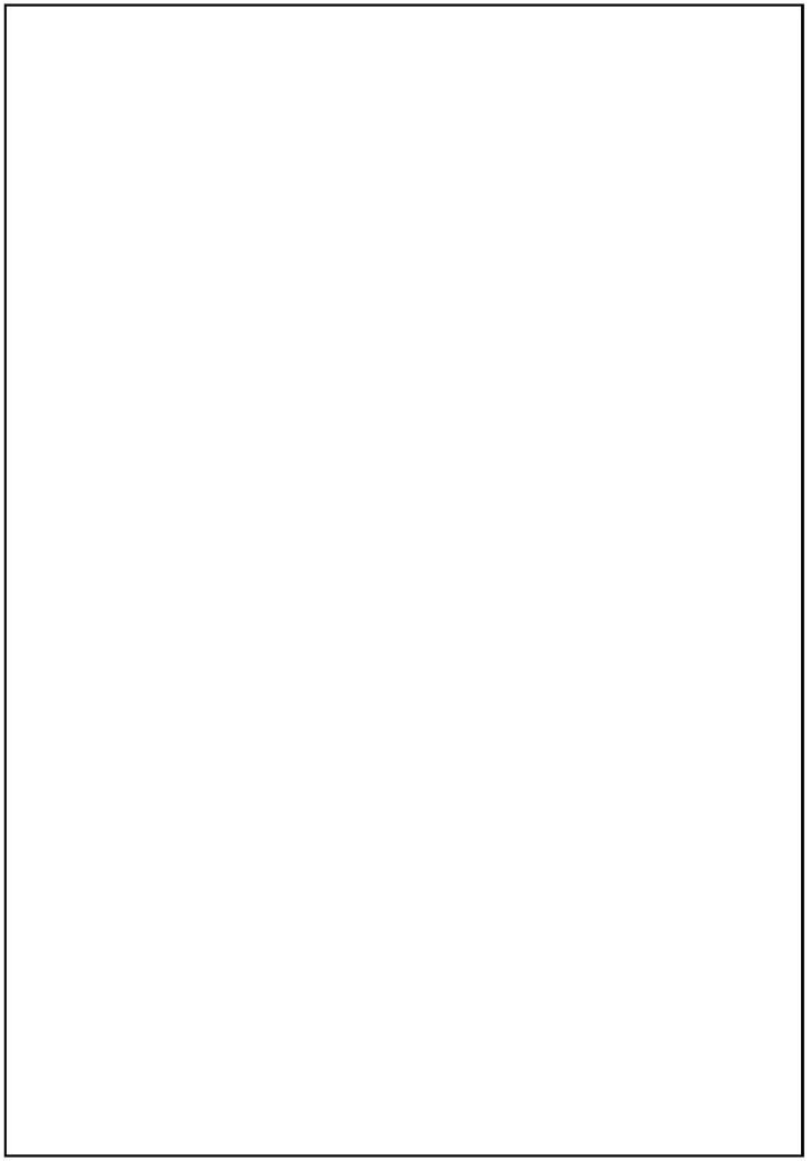
Above, cover stones when tomb was first appearing.

To right and below, pedestal of stones left by PLANE. =

CF-57

Description of the interment and offerings:

Was not a funerary context.



Notes from Bonnie Yoshida on the skeletal remains:

None.

Burial CF-58 R-2077 -- No context info

Description of the burial and offerings:

Late Piñami (at earliest) burial excavated completely by PLANE in 2002 before the arrival of ZT and KA. No context information or photos. The bones were retained together in separate bag by PLANE, possibly due to their excellent preservation but no other identifying information was present.

Context of burial: Unknown, except it was <u>not</u> the Illataco or Early Piñami Phase when Anderson and Terceros were present. It could be Late Piñami, Late Intermediate or Late Horizon.

Body position: Unknown.

Orientation of body: Unknown.

Other: Examination by Bonnie Yoshida showed there were significant cut marks all over the skull and the long bones. The bones are hard and yellowy like camelid bones used for tools (suggesting some kind of heating or other treatment to harden the bone) and very unlike any of the other human remains in hardness and preservation. Likely this individual had the skin removed from the bones and his/her bones were heat treated or cooked at some point. It is the only skeletal material we have at Piñami demonstrating cutting and heating/cooking of a human.

Burial type: Unknown.

Burial chamber and method: Unknown.

Offerings: No information available.

Notes from Bonnie Yoshida on the skeletal remains:

Child -- 8 or 9 years old, clear evidence of cut marks on cranium and long bones.

Cranium shows cut marks. Bones were particularly hard and yellowish suggesting some type of heat treatment.

Burial CF-59 R-2078a No context info

Description of the interment and offerings:

This skull was donated back to the collection by a neighbor who had obtained it from the mound years before our excavations.

Context of burial: Unknown

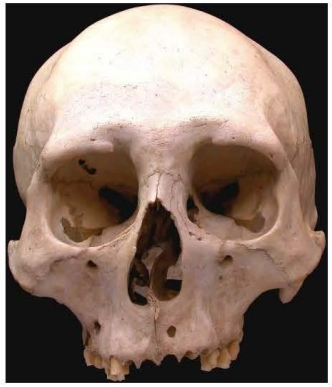
Body position: Unknown

Orientation of body: Unknown

Burial type: unknown—skull was found at Piñami and restored by neighbors

Burial chamber and method: Unknown

Offerings: Unknown



Notes from Bonnie Yoshida on the skeletal remains:

Adult, skull shows significant deformation of annular type

Burial CF-60 R-2078b no context info

Description of the interment and offerings:

This skull and mandible were donated back to the collection by a neighbor who had obtained it from the mound years previous. This skull had been painted gold by the neighbors and displayed on their mantle.

Context of burial: Unknown

Body position: Unknown

Orientation of body: Unknown

Burial type: Unknown—skull was found at Piñami, restored by neighbors

Burial chamber and method: Unknown

Offerings: Unknown

Notes from Bonnie Yoshida on the skeletal remains:

Adult

Golden skull, no photos

Burial CF-61

R-2033-2034 PLANE Sector B, Level ~16

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT. Re-excavated in 2003 but was too disturbed for further information.

Context of burial: Unknown, the burial was outside the dense cluster of burials. Based on horizontal position, Illataco or early Piñami phase.

Body position: Seated flexed.

Orientation of body: Body was facing east with the back to the west. The body had slumped to the right.

Burial type: Burial in round pit with cover stones.

Burial chamber and method: Circular in plan, cross-section impossible to determine due to the method of excavation. From the photos, it appears that the pit had a covering of stones. However, the method of connection between the cover and the pit cannot be determined due to lack of documentation.

Offerings: 4 ceramic vessels placed in front of the body: a vasija, a bowl, a jarrita and a jarra. Though eroded, the vasija was very finely done with the repeated figure of a raptorial bird. Based on the paste, this vessel was clearly imported from Tiwanaku. The bowl was an undecorated shallow base libation bowl. The paste was not diagnostic of local or foreign manufacture. The other two, a small jarrita and a broken jarra, are clearly local Cochapampa style.

Cover stones associated with the burial

Body seated flexed facing east

Notes from Bonnie Yoshida on the skeletal remains:

No skeletal materials were available for analysis.

Burial CF-62 R-3012 Sector A, PLANE Level 18

Description of the interment and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited notes and photos by KA and ZT.

Context of burial: Sector A, Level 18 the burial was located within the early burial cluster. The general context was unknown but likely was a cemetery context.

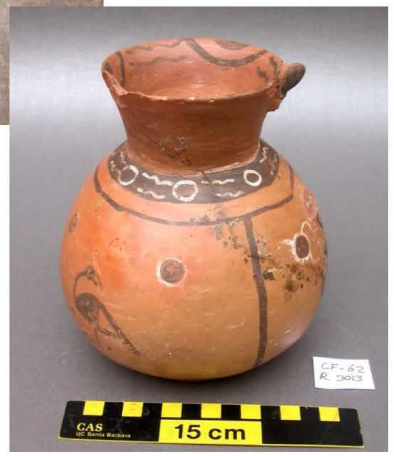
Body position: Unknown.

Orientation of body: Unknown.

Burial type: Unknown—possibly a burial in a pit.

Burial chamber and method: Not registered but the photos suggest a shallow pit of circular plan.

Offerings: 1 ceramic vessel but complete burial context unknown. Likely just one vessel. Color of the paste is quite unusual and not present in CVCT. Possible import but no indication that it is from Tiwanaku itself—looks like some found at Moquegua.



Notes from Bonnie Yoshida on the skeletal remains:

No skeletal materials retained for analysis. Photos of bones and teeth indicate adolescent or adult

Burial CF-63 R-26 Sector C exterior North

Description of the interment and offerings:

Late Piñami burial excavated by Proyecto Piñami in 2002. Burial was found in a passageway in the mound to the north of Sector C, outside the excavation unit—possible double burial or parts of two burials.

Context of burial: Exact context unknown. Temporal context is Late Piñami Phase.

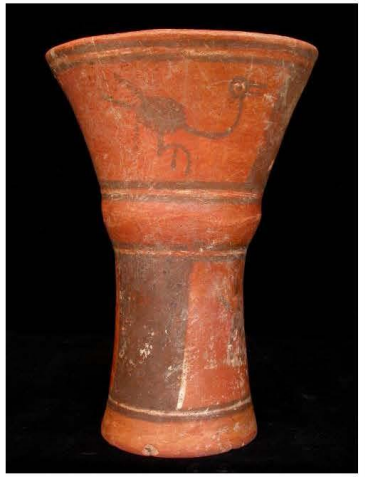
Body position: Unknown. Only teeth were recovered. The majority of the teeth correspond to a child age 2-4 years old. However, there were four teeth of a child much younger. Whether this was a double burial or two burials close in space is unknown.

Orientation of body: Unknown.

Burial type: Unknown.

Burial chamber and method: Looks to be an irregular pit with a round plan.

Offerings: 1 ceramic vessel, a Cochabamba-Tiwanaku style kero. The thin black/white/black banding used to separate design space on this vessel shows influence of Omereque/Caraparial style. It is possible that there were other offerings associated that were not found.



Notes from Bonnie Yoshida on the skeletal remains:

Teeth only. Most from a child, 3 years +/- 12 months

(plus 4 teeth, too young for this individual)

Burial CF-64 R-3018 Sector A, PLANE Level 18

Description of the burial and offerings:

Illataco-Early Piñami burial excavated by PLANE. Only limited photos by KA. Recorded due to the unusual modeling on the larger vessel.

Context of burial: The burial was located within the Early Group burial cluster. Illataco/Early Piñami context.

Body position: Unknown. Human teeth and a long bone are visible in the photo. It can not be confirmed whether they are in their original position or what relationship they have with the nearby offerings.

Orientation of body: Unknown.

Burial type: Unknown.

Burial chamber and method: Unknown.

Offerings: Two ceramic vessels that may or may not be part of the same burial. The open form tinaja had modeled lizards as shown. The other vessel is an open mouth utilitarian vessel, possibly a cooking pot. Both vessels were lost from the collection but based on the photos are Formative Monochrome style. The tinaja with modeled lizards is particularly characteristic of the Formative.

Notes on the skeletal remains:

No skeletal materials.

Close up of modeled lizards. Modeled figures are found in the Formative Monochrome style.

Burial CF-65 R-3019 Sector A, PLANE Level 14/15

Description of the interment and offerings:

Illataco-Early Piñami burial excavated by PLANE. Limited photos by KA.

Context of burial: The burial was located within the early burial cluster. The general context was unknown but likely was a cemetery context.

Body position: Unknown.

Orientation of body: Unknown.

Burial type: Urn with covering stones.

Burial chamber and method: The form of the burial pit was not recorded, but likely round. The urn has a broken base. It was placed upside down in the pit and the two offerings (and presumably the body) were placed inside of it. Three large stones were placed vertically on top of the broken section of the base to fill up the open space and possibly to serve as marker stones or a comparable stone cover.

Offerings: 2 ceramic vessels plus the *tinaja* itself. The tazón was Sauces style (based on paste and technology—not painted). The jarra is Cochapampa style. The tinaja is wide bodied with incised horizontal shoulder supports. The tinaja's paste used dense shale temper which is typical for local Cochabamba styles.

Notes from Bonnie Yoshida on the skeletal remains:

No remains retained for analysis. No info on age.

Burial CF-66 R-3021 Sector A, PLANE Level 18

Description of the interment and offerings:

Illataco-Early Piñami burial excavated by PLANE. Minimal photos by KA.

Context of burial: Within the early burial cluster.

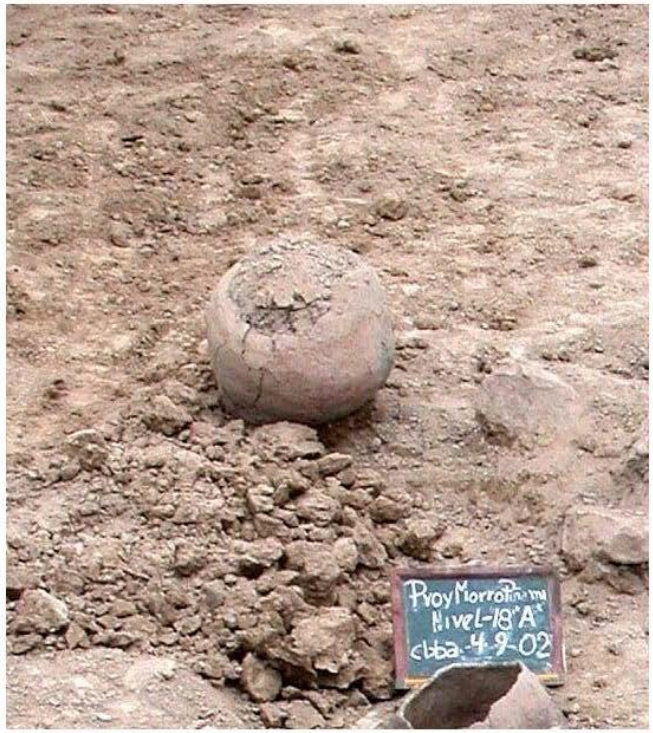
Body position: Unknown.

Orientation of body: Unknown.

Burial type: Possible urn burial.

Burial chamber and method: Possible urn burial.

Offerings: Aside from the urn, unknown. Shape of the vessel suggests it was a tinaja rather than an olla.



Notes from Bonnie Yoshida on the skeletal remains:

No skeletal materials

CF-67 (formerly HR-01) R-2054 Sector B, PLANE Level ~17

Description of the burial and offerings:

Upper portion of burial destroyed by PLANE in 2002. We excavated this feature in 2004 thinking it was an ash dump since the loose dirt was very ashy. However, there were human remains in the dirt and the ash lens continued beyond the limits of the pit in all directions. Thus, it is most likely this was a pit burial that happened to cut into an ash lens at its base.

NOTE: This may be the same individual as C- 38, R-2055. Both are adolescents ~15 years old.

Context of burial: The burial was in the cluster of burials in Sector B. It was cut into by CF-51 and appears to have been placed after CF-38 (see top photo).

Body position: Unknown.

Orientation of body: Unknown.

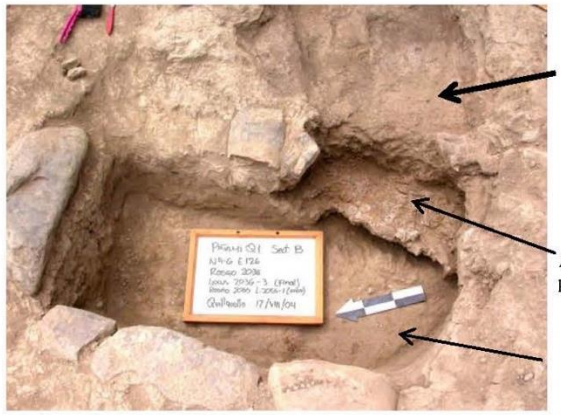
Burial type: Unknown.

Burial chamber and method: Possible pit burial but context almost completely destroyed by PLANE. What remained is oval shaped but it is unknown if this shape was unaffected by the PLANE excavations.

Offerings: If there were any associated offerings, they were removed by PLANE without photos or notes.

Notes from Bonnie Yoshida on the skeletal remains:

Adolescent, 15-19 years based primarily on teeth, no sex determination possible. This may be the same individual as CF-38 (R-2055)



Base of CF-67 pit—only the lower portion was excavated as a feature.—the upper portion by PLANE.

Appendix 3:

Physical Anthropological Analysis of the Piñami Human Remains

by Bonnie Yoshida

CF 8
R-2045 Sector A, Level 17
Adult, possible male, no teeth but some cranial vault fragments were present. (check data sheets)

CF 10
R. 2065
Probable female adult

These remains consist of an adult individual, probably female. Although only fragments of the pelvis were present, a portion of the subpubic region suggests a wide subpubic angle. Skeletal elements present included portions of the vertebral column, ribs, pelvis, humerus, femur and foot bones. No cranium or teeth were present. Due to the lack of diagnostic elements, no refined age estimate was possible, other than adult.

CF 11
R. 2049
Male adult, 35 to 45 years

These skeletal remains consist of an adult male of middle age. Compared with other burials at Pinami, this individual was relatively well-preserved. Portions of the cranium, shoulder girdle, thoracic and lumbar vertebrae, pelvis, left arm, left and right leg, and hand and foot bones were present. This individual was identified as a male on the basis of greater sciatic notch form, and skull morphology. Age was estimated as middle adult (age 35 to 45 years) based primarily on auricular surface appearance. This estimate is supported by observation of significant cranial suture closure and the presence of degenerative joint disease in the vertebral column.

Several pathological conditions were evident in this individual. This individual displayed Schmorl's nodes (a vertebral pathology) in thoracic vertebrae 6-8. These vertebrae also showed indication of compression and osteophyte growth. The left hand displayed fusion of the fourth proximal and medial phlanges. A portion of the second rib showed evidence of a healed fracture. Additionally, this individual displayed considerable robusticity at muscle attachment sites; notably, the deltoid region of the humerus. The teeth displayed moderate wear. A hypoplastic lesion was present on the second left maxillary incisor. A smooth-walled non-carious pit was evident on the occlusal surface of the right third molar.

A bone sample was taken.

CF 12
R. 2038

7/21/05
Child 8 years +/- 24 months

These skeletal remains consist of a child around 8 years of age. Compared to the other burials at Pinami, the skeletal remains of this individual were in fair condition, though not complete. The cranial vault was approximately 75% complete, Post cranial elements present include the ribs (about 75%), vertebral column, right humerus, right pelvis, left femur, and a portion of the right tibia. Age was estimated based on the development of the incisor, premolar and first molar roots. A carious lesion was observed on the right deciduous second molar.

CF 13
R. 2043
7/21/05
Adult, indeterminate age and sex

This extremely fragmentary set of remains are identified as an adult of unknown sex or age. Less than 5% of the skeleton was present. Elements present include small fragments of rib, humerus, and lower limb bones. One tooth was present (upper left second incisor). Adult status was based on epiphyseal fusion of the distal humerus.

A bone sample was taken.

CF 15
R. 3007
7/19/05
Young adult female

These skeletal remains consist of an adult female, of young to middle age. With the exception of the cranium which was fragmentary and in poor condition, most of the skeletal remains were in fair condition and nearly complete. This individual was identified as female on the basis of pelvic features. In addition, the post-cranial remains were relatively small and gracile. Age was estimated using the pubic symphysis and auricular surface scoring method. Although the partially eroded surfaces of these regions made a fine-grained age estimation difficult, age estimates from both methods were generally in agreement. An age of 25 to 35 years is estimated.

The left distal fibula displayed bone thickening consistent with a healed fracture. A hypoplastic lesion was observed on the left first incisor. The lower second incisors were peg-shaped.

CF 16
R. 3008
7/19/05
Middle adult female

These skeletal remains consist of an adult female, of middle age. The skeletal remains were in fair condition, and portions of all major skeletal regions were present, though highly fragmentary. This individual was identified as female primarily on the basis of cranial features, and secondarily on the basis of a single pelvic trait (a portion of the ascending ramus displayed a relatively obtuse angle). In addition, the long bone dimensions

were relatively small and gracile. An age range of 35 to 45 years was estimated on the basis of pubic symphysis and auricular surface features.

The right femur had a healed fracture on the distal metaphysis. A large, non-carious pit was present on the maxillary right third molar.

The presence of portions of two left femora, two left maxillae, and a clavicle fragment in this assemblage indicates that skeletal elements from a different individual were present. These seem to be isolated; there was no other indication of a mixed burial context. However, as both femora had similar dimensions, it was not possible to discern which femur belonged to the primary individual.

Bone sample (tibia fragment) taken.

CF 17, Individual A
R. 3009
7/20/05
Young adult male

This funerary context contained the remains of two individuals. Individual A, the primary individual, appears to be relatively complete, while Individual B consists only of lower limb bones. Unless otherwise specified, the assumption is that skeletal material belongs to Individual A.

Individual A is an adult male, of relatively young age. The skeletal remains were in fair condition, and portions of all major skeletal regions were present, though fragmentary. This individual was identified as male primarily on cranial features and secondarily on the extremely robust appearance of the post-cranial skeleton. This individual was classified as "young adult" on the basis of sternal rib end morphology and minimal tooth wear.

No skeletal or dental pathology was noted. This individual was distinguished by marked post-cranial robusticity.

CF 17, Individual B
R. 3009
7/20/05
Adult, age and sex indeterminate

This skeletal assemblage consists of lower limb bones: small portion of the right pelvis, and paired femora and tibiae. No other skeletal elements were present. No obvious dimorphism was present in femur size or form.

CF 18
N19, SectA-2
7/12/05
Middle adult female

These skeletal remains consist of an adult female, of middle age. The skeletal remains were in relatively good condition, and portions of all major skeletal regions were present.

This individual was identified as female on the basis of cranial features. In addition, the post-cranial remains were relatively small and gracile. An age range of 30 to 40 years was

estimated on the basis of auricular surface features. Moderate tooth wear and the presence of degenerative joint disease are consistent with a middle to older adult.

This individual displayed evidence of osteoarthritis. Compression and porosity of the thoracic vertebral bodies and porosity and bony apposition on the patella and olecranon of the ulna were evident. This individual had numerous carious lesions on the occlusal and interproximal surfaces of the first, second and third molar teeth.

CF 19
7/21/05
Adult, no age or sex information

These extremely fragmentary skeletal remains of an adult consist of a thoracic vertebrae fragment, femur fragments and tibia fragments. No cranium or teeth were present. Adult status was discerned based on the thickness of the long bone shaft fragments. No sexually dimorphic features were present.

CF 21
R. 2010
7/14/05
Adolescent, probable female

These skeletal remains consist of an adolescent, probably female between 14 and 18 years of age. Compared to the other burials at Pinami, the skeletal remains of this individual were in fair condition, though not complete. Although growth was not terminated, the presence of a preauricular sulcus and relatively wide sciatic notch suggest a female. Additionally, body size was extremely small and gracile. Age was estimated based on third molar root development and epiphyseal fusion.

The cranial vault surface displayed some porosity, and a scaly, layered appearance. Although to the surface condition of the bones was very poor, it appears that this porosity is outside normal range. Ribs also displayed striations suggestive of new bone growth. While a specific etiology of these bony changes can not be discerned, they are most likely attributable to infection or nutritional deficiency. Hypoplastic lesions were present on the left and right mandibular canine.

CF 24, Individual A
R. 189
7/21/05
Adult, possible female

This funerary context contained the remains of two individuals, labeled Individual A (adult) and B (neonate). Both were in extremely poor condition with eroded surface texture.

The skeletal remains of Individual A were in poor condition; portions of all major skeletal regions were present, though fragmentary. Five teeth and 3 unidentified tooth roots were present. This individual was identified as a possible female on the basis of a relatively open sciatic notch fragment, and gracile femur head. Although no diagnostic pelvic age indicators were present, significant tooth wear suggest and adult over age 30.

Other than a variation in incisor form (barrel-shaped incisor), no notable features or pathologies were observed.

CF 24, Individual B
R. 189
7/21/05
Neonate (birth to 2 months)

Individual B consists of the remains of a neonate. The cranium was nearly complete, but the rest of the skeleton was very fragmentary and incomplete, consisting of fragmentary pieces of rib, vertebrae, pelvis and long bone shaft. Age was estimated based on deciduous molar crown development.

Bone samples were taken.

CF 25
R. 195
7/12/05
Juvenile 10 years

These skeletal remains consist of a juvenile approximately 10 years (+/- 30 months). Compared with other burials at Pinami, the skeletal remains of this individual were in good condition; portions of all major skeletal regions were present, though fragmentary. Nearly all teeth were present. Age was estimated based on dental development (premolar and molar root formation).

No skeletal abnormalities were observed. A large carious lesion affected the crown and root of the deciduous maxillary right second molar. Enamel pearls were observed on the left maxillary first molar.

CF 26
R. 197
7/22/05
Juvenile 5 years +/- 16 months

These skeletal remains are of a juvenile approximately 5 years of age. This burial was extremely fragmentary and incomplete, consisting of cranial vault fragments, a portion of femur shaft, and unidentified small cancellous bone fragments (likely vertebrae or os coxae). Age was estimated on the basis of dental development (premolar crown formation).

No skeletal or dental pathology was observed.

CF 27, Individual 1
R. 198
7/22/05
Adult, sex undetermined

This funerary context contained the remains of two individuals, labeled Individual 1 and Individual 2. Both were in poor condition with eroded surface texture.

These skeletal remains belonging to Individual 1 consist of an adult of indeterminate age and sex. The skeletal remains were in poor condition and incomplete. Elements present include fragments of cranium (less than 10% present), teeth (approximately 50%), ribs, humerus, pelvis, femur, right patella and tibia. No diagnostic pelvic or cranial age or sex indicators were present, though moderate tooth wear suggests an adult over age 25.

Hypoplastic lesions were observed on the right and left mandibular canines. No other pathology was recorded.

CF 27, Individual 2
R. 198
7/22/05
Adolescent 15 years +/- 36 months

Individual 2 is an adolescent of unknown sex. Although portions of most major skeletal regions were recovered, the friable bone texture made recovery in the field very difficult. All teeth were present, though loose. Age estimation was based on third molar root development.

No skeletal or dental pathology was evident.

Tooth sample was taken.

CF 28
R. 1170
7/22/05
Adolescent, probable male

These skeletal remains of an adolescent were relatively complete; portions of all major skeletal regions were present. However, the surface texture was highly eroded. The right side of the body seemed to be in poorer condition than the left. Age was estimated based on third molar root formation and epiphyseal fusion. Sex is tentatively estimated as male based on the large femoral and humeral head diameter and greater sciatic notch formation (fragmentary). No female pelvic traits were observed.

A hypoplastic lesion was observed on the mandibular canine.

A tooth sample was taken.

CF 29
R. 1180
7/10/05
Female, aged 25 to 35 years

These skeletal remains consist of a young adult female. Most of the skeletal remains were in fair condition and nearly complete. This individual was identified as female on the basis of pelvic features, including an extremely deep and elevated preauricular sulcus. In addition, the post-cranial remains were relatively small and gracile. Age was estimated by evaluation of the pubic symphysis auricular surface, and sternal rib ends.

Dental pathology included a large carious lesion on the occlusal surface of the lower left and right second molars, and evidence on the mandible of periodontal disease.

CF 30
R. 1181
7/23/05
Juvenile age 6 months +/- 3 months

These skeletal remains consist of an infant. The remains are in fair condition, though incomplete. Elements present include the cranial vault, left and right os coxae, left humerus, radius, ulna and femur, along with fragments of ribs and vertebrae. Age was estimated on the basis of deciduous canine and molar crown formation.

No skeletal abnormalities were noted.

CF 32
R. 260
Probable female, middle to older adult (over 40)

This individual is a middle to older adult over 40, probably female. The absence of sexually dimorphic pelvic and cranial elements made the sex estimation tentative. The relatively gracile long bone appearance also support the female designation. The available age information suggested a female at the older end of the middle adult range. While the auricular surface score indicated an age of 40-44, there existed a marked loss of bone density, particularly in the vertebral column.

This individual had relatively complete, though fragmentary long bones and cranial vault. The axial skeleton (ribs, vertebrae and os coxae) was less complete. A portion of the mandible and some teeth were present.

Apart from the possible loss of bone density in the vertebral column, the only pathological condition was the presence of a hypoplastic lesion on the upper left canine.

CF 34
R. 296
Child, age 5 years +/16 months

This individual is a child, age 5 years +/16 months. The age estimation is based on the development of the first and second permanent incisor root, and the development of the second molar crown.

The remains of this individual were highly fragmentary. While the majority of the cranial vault was present, it was highly fragmentary. Less than 50% of the post-cranial skeleton was present. No metrical measurements were feasible. No pathological condition was noted.

The upper lateral incisors were diminutive in size and barrel-shaped (a common non-metric variation). No dental pathology was noted.

CF 36
R. 2073
Adult, no age or sex information

These skeletal remains were very incomplete and in extremely poor condition. No age or sex information was available. The only skeletal elements present were 8 cranial fragments, two femur epiphyseal fragments and several other unidentified long bone fragments. No pathological conditions were noted.

A portion of a maxilla containing 2 teeth and 2 teeth roots was included in a bag from a disturbed context. As this bone had markedly better surface condition, it did not appear to be from this individual.

CF 37
R. 2050
Child, age 3 years, +/ 12 months

This assemblage contained the remains of a three year old child. The remains were very incomplete and fragmentary, consisting primarily of rib fragments, isolated teeth and

long bone fragments (mostly lower limb). Six adult teeth were included in this assemblage, but do not belong to this individual.

The age was calculated based on eruption of formation of the upper and lower incisors and the lower right canine. No pathological conditions were noted.

The second deciduous right molar was taken as a sample.

CF 38
R. 2055
Adolescent—15 years, +/- 3 years

The remains of this individual were fragmentary, consisting of three small cranial fragments, 7 teeth and fragment of left mandible, approximately five small rib fragments, the distal epiphysis of the left humerus, four thoracic vertebrae, and a portion of the left os coxae and sacrum.

Age was determined by dental eruption and epiphyseal fusion. The lower left third molar root was 75% complete. The epiphyseal vertebral rings and iliac crest were unfused.

The only noted pathological condition was a hypoplastic lesion (horizontal, 3.10 mm from the cemento-enamel junction).

Samples were taken of the left mandibular first molar, and a humeral shaft fragment.

R. 2058a
Individual A
Child 8 years +/- 9 months

This assemblage contained the remains of two individuals. The individual considered to be the primary individual is designated Individual A. Individual A was a child of approximately 8 years. Age was estimated based on tooth formation and eruption (maxillary canine, and first and second molar).

The condition of the bones was extremely friable and the skeletal elements recovered were extremely fragmentary. Skeletal elements present included small pieces of the cranial vault (primarily occipital and temporal bones), teeth, and portions of the upper torso (shoulder girdle, ribs, humerus, and small fragments of os coxae. No lower limb bones were present.

This individual displayed no visible pathologies. Peg-shaped incisors were present.

CF39b
R. 2058b
Individual B
Adolescent 15 years +/- 6 months

This is the secondary individual in the assemblage. Age was estimated based on second and third molar root formation. As with Individual A, the condition of the bones was extremely friable and the skeletal elements recovered were extremely fragmentary. Age was estimated based on third molar tooth formation.

CF 40
R. 2066
7/23/05

Juvenile

This extremely poorly preserved set of remains consists of a portion of a cranium of a juvenile. No diagnostic age or sex information was available. Juvenile status was estimated based on the thickness of the cranial vault. No post-cranial material or teeth was present.

No samples taken

CF 6542
R. 2075
6/27/05
Adult

This assemblage consists of a portion of a cranium. No postcranial material was present. The right parietal, temporal and a portion of the left and right occipital were present. Cranial vault thickness and mastoid process suggests an adult. As the mastoid did not display size dimorphism, sex could not be estimated. There was a well-healed area of mild porosity on the cranial vault around lambda.

No samples taken.

CF 43
R. 25
9 months +/- 3 months
7/12/05

This assemblage consists of extremely fragmentary portions of cranial vault, teeth, ribs, and vertebrae. Age was estimated on the basis of dental development (second deciduous molar, first permanent molar and upper incisor).

CF 45
R. 2017
7/25/05
Possible male, 30-40 years

These skeletal remains consist of an adult of middle age, possibly male. The remains were in fair condition, though not complete. The majority of the cranial vault was present, with the exception of the frontal bone which was absent. Post-cranial elements present include fragments of shoulder girdle, ribs, thoracic and lumbar vertebrae, os coxae, and the majority of the long bones. All teeth present were mandibular teeth.

Age was estimated at 30 to 40 years based on auricular surface changes and sternal rib ends. No sexually dimorphic pelvic elements were present. The nuchal crest, the only sexually dimorphic skull feature, was ambiguous. Relative post-cranial robusticity suggests a male; however, neither the deltoid nor the femur midshaft measurement was large.

The centrum of one thoracic vertebrae was visibly eroded (about 1 cm diameter); this was was most likely post-mortem damage, rather than an erosive lesion. Slight porosity was present on the distal humerus, indicative of mild osteoarthritis.

Bone and tooth (mandibular left M1) samples were taken.

CF 47
R. 2019

T. 4
Adult; indeterminate sex

These remains consist of an adult individual of indeterminate sex. No cranium was present, though loose teeth were present. Skeletal elements present include sternum and ribs (fragmentary), 7 vertebrae, and relatively well-preserved portions of upper and lower limb bones. The robusticity of long bones suggests a male.

Samples taken of humerus and lower left first molar.

CF 48
R. 2020
7/25/05
Adult male, middle-aged

These skeletal remains consist of an adult male of middle age. Skeletal elements present include about 25% of the cranial vault, maxilla, mandible, sternum, vertebral column, upper limb, portions of the pelvis and sacrum, and foot bones. Nearly all teeth were present (two third molar teeth were lost post-mortem). A few fragments of femur were present along with the right patella. This individual was identified as male on the basis of pelvic characteristics (incomplete ischiopubic ramus ridge and greater sciatic notch), and features of the mandible. The age estimate was obtained using the right pubic symphysis and the right auricular surface (incomplete).

No pathological conditions were noted on the skeleton. The right second molar had a carious lesion. Malocclusion between the right second incisor and canine was observed.

An additional distal portion of a right humerus was included in this assemblage. No other obvious signs of more than one individual were present.

Samples were taken of a long bone portion and the left upper incisor tooth.

CF 54
R. 2040
Adult, possible male
7/24/05

This assemblage contained the remains of an adult. Most of the skeletal remains were highly fragmentary (bone fragments less than 1 cm diameter). Skeletal elements present include cranial vault (about 50% present), mandible, cervical and lumbar vertebrae, and small portions of the humerus, pelvis, femur and tibia. No teeth were present. While no diagnostic age or sex indicators were present, the robusticity of the femur shaft and relative breadth of the distal humerus suggests a male.

Bone sample taken of femur shaft fragments.

CF-67
R. 2054
7/18/05
Adolescent, 15-19 years

This assemblage contains the skeletal remains of an adolescent of indeterminate sex. Age was estimated on the basis of third molar root formation (root > 80% complete) and epiphyseal fusion (unfused femur head). Skeletal elements present include the acetabulum

and the proximal portion of the left femur. Teeth were loose (approximately 50% of teeth present).

Faint linear enamel hypoplasia occurred on the maxillary second incisor and canine. The crowns of the second molars displayed a distinctive flattened form in occlusal outline.